<u>FERRANTI</u>

NEWS IN BRIEF

Neddy's plan on Threshold

THE Neddy manpower subcommittee is likely to recommend that the National Computing Cantre's Threshold trsining scheme should form the basis of increased government investment in the training of

young people,
Although the sub-committee discussed proposals for the government procurement policy to encoursge software houses to develop software for Britiah minis (CW, November 24), the final recommendation is likely merely to state that the procurement policy should take sccount of manpower impli-

The sub-committee does not recommend any sum for capacity fibre optic channels government investment in com-

3030 add-ons

ADO-ON memories for IBM 3030 computers will be svallable In Europe early next year from Telex. Manufoctured in the US by intel they come in one Megabyte modules and can be attached to the 3031, 3032 and 3033.

Takeover

COMPUTER media storage firm, Oatakcep, has been acquired by the proprietors of Hay's Wharf Ltd. Datakeep stores computer stationery and magnetic tapes at its East London premises. Hay's Wharf al-ready has a subsidiary, Hay's Business Records Centre Ltd.

Expanding

SUNBURY-BASEO bureau and software house Systemsolve has achieved a tumover of £500,000 this year, and the axpanding company has opened a bmnch office at Manchester.

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3030 pricing policy 'changed rules'

gence of the Jepenoso computer industry were two
of the key events of the lest year, according to Logica

The 3030 pricing policy "changed the rules of the gems," he believes, and could signify that 19 M was plenning to shift more into the services rather then the menufocturing business. He also pointed out that Fujitsu was now challenging DEC for No 2 pieco

Hughes were speaking in London lost week moeting of the ACM chepter of the SCS.

Ho reiterated the main points ho made in en erticio earlier this year shortly siter returning from a year's sebbsticsi leave (CW, July 21). These were the smergence of DEC as No 2 menufocturer; the micro

revolution; the occoptance of packet switching; minis from moinframe mnnufacturere; and the Jn-

cute hori omerged. Pointing out that iBM's pro-fitability last year was 27 por cont, he soid that iBM method the profitability it was accustemed to, the corporation had to find new sources of revenue.

He sold that he bolleved IBM would be moving to the services business in the sense that it would be offering telior-mode solutions to problems, in the same ways as current systems houses and burseux.

But he pointed out that this would require a major shift in IBM ways of working and could be limited by e evellability of suitable resources. What Amdohi thinks of the price cuts . . . page 20 .

RACAL reports record turnover

and profit figures — and the resignation of the company's

For the first half to September

30, Rocal's profits are up 68% to

£19.4 million on turnover up 75%

which had been expected to de-

Hasp II IBM emulation puckages

can now lie run on the 16-hit

micrnNava microcomputer

family fallowing the introduc-

tlun of a new range of com-

municutions enhancements. In

addition, separate emulation

packages permit the microNova

tu communicate with any Duta

General or IIIM hust processor.

millinn tu £10 milliun.

company since 1960.

New range

deputy chairman

Public data nets in PO plan for 1980s

Poat Office dsta communication services includes a possible all digital circult-switched public dsts network by 1985 and highcarrying everything from colour television to gas and electricity

Hughes . . . key ovents of this

meter readings in 30 years' time. in the immediate future, the go-shead for s national public acket-switched network ia likely Io be given in January, when the Post Office Board ration of digital links, and to meets to discuss the final proposals for the network. The usoge charges for the network are likely to be distanceindependent, sithough there will

be distance-dependent sccesa These pointers to the future

were given to users sttending seminars conducted by the Dapartment of Induatry's National Committee on Computer Networks in London last week. The speaker was Brian Cross, head of the NP4 network planning group in Post Office Telecom-

A wide range of enhancements to services was forecast by Cross, including the appointment of dsta sarvicea managers in Post Office Telecommunications to look after the Interests of users.

"Word processing and electronic mail sre on the way, and

THE shape of things to coma in electronic funds transfer systems are likely to be the most significant development," he

> Digital linka would be greatly increased in the trunk and junction networks over the next few yesra, but digital links from the office to the local exchange were a long way off.

A circuit switched network would only become feasible once there was a wide penetstart with its geographic coverage would be restricted.

More inimediately, Cross saw an expansion in the number of databases sccessible from the UK, and further Improvements In Datel were coining. "The 12-month forecasts for

acceases to transatiantic databssea were exceeded in three months when we introduced the links to Tymnet and Telenet earlier this year and we are introducing sn X25 public packet two networks.

switched access service, initially just to the US, though It is likely to extend to other places later.

"We will be introducing Datcl 4800 next yesr and Oatel 9800 soon after. At present full duplex on the switched network is only available at 300 bps, but it will be enhanced to 1200 bps next year.'

 The public packet-switched service is likely to have nodes in London, Manchester and Birmingham and slx other multiplexer access points to start with (CW, October 27). As revealed earlier this year (CW. July 21), it is also likely in be based on the microprucessorcontrolled switching technology developed by TRT in France for Transpac and also being used in Euronet. However, UK mlnicomputers could replace the Mitra 125 mlnis which are used as exchange supervisors in those

£1.5m minicomputer turnkey contract goes to CORT

ONE of the biggest single minicontracts placed in the UK, with simultaneous stack allosecured by CORT, Commercial Real Time, of Twickenham. The olggest pharmaceutieni wholasolers, Garclaya and Sons, which each of its 28 depots.

The insin application at each computer turnkay systems site is real time order processing, worth over£1.5 million, has been cation and update and invoice/ picking list printing. A notuble faature of the softwore aupplied customer is one of the UK's by CORT is an English language product identification method which enables a single pruduct la being supplied with a POP- to be identified within two se-11/34 based configuration for conds from more than 10,000 different itema.

Inter-union row on PO board

PLANS by the Post Office to Workers and the Post Office form a new Post Office Board Engineering Union claimed two next month, including aeven seats for union representatives, places each, while the Civil and Public Services Association, the Public Servants.

The SCPS, which represents higher grades of management, including computer staff, was excluded from the workarfiva of the larger unions claimed the sliotted places.

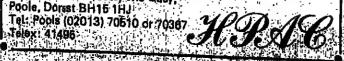
are to go shead despite protests from the Society of Civil and Staffs' Association and the Soclety of Post Office Executives

claimed one each. The SCPS has said that because it has bean left out, it now has a number of options open to participation experiment when it, the most extrame being a policy of non-co-operation in the experiment. It is holding s Tha Union of Post Offica meeting today (Thursday).

CORAL 66 COMPILER FOR PDP-11

The RMCS CORAL 66 compiler for the PDP-11 is obtainable with full maintenance and support from:

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Honeywell makes impact with Level 64

MORE sggressive UK marketing of the Honeywell Seles 60 Level 64 computers is begin-ning to make an impact on the competitive user base. About one in five of recent sales has replaced established IBM, ICL and Univac accounts.

The most recent new customer is Wolverhampton and Merclo Building Society which lias ordered a model 64/30 yr lued at £300,000 to replace its It1M System 3.

at almost £90 million compared One factor which led to the with the same period last year. selection of the Honeywell Pre-tax profits of £45 million for machine against competitive the full yeur are forecast, which IBM and Univac tenders was the compore with £32.7 million last system conversion alds available on Level 64, Disc file formets are Racal's Milgn acquisition, IBM compatible and comprehensive fucilities are provided for the emulation of various enpress the company's overall vironments and for program profitability, is now looking conversion.

much healthier with the forecast The availability of full datafor the year revised up from £7.5 base and transaction processing software on Level 64 is seen by Deputy chairman of Racal Honeywell us a major selling Electrunics, Oliver Prenn, has point. The first UK users of the resigned. He had been with the transaction processing system TDS, were Boumemouth courcil anul Vuux Br weries, Sundaland, which both operate 61/28 DATA General's R.tE80 and models. TDS offers comprehen sive security features, based on the Multics system, and these were of key significance is the

Bournemouth application Worldwide orders for Level & in the UK, the machines are seen as competition for the recently unnounced ICL 2950. More on Levet 84, pages 3 and 1.

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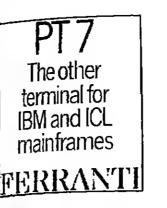
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investment, GEC has decided to channel

some of It into the US, and former ICL

msnaging director, Geoff Cross Is to head s

shell" company in Californis to look for

GEC has been slow to Invest in the US, but

is now keen on acquiring companies which mesh with any of its businesses, including

electronics, electrical, telecommunication

Following a flood of Inquiries about pos-

sible ocquisition, GEC is not commenting on

 $(v_{i+1})_{i \in I} A_i A_{i+1} = (v_{i+1})_{i \in I}$

Number 580/1

Thursday, December 15/22, 1977

Cross joins GEC to buy US companies

nntional company is seeking a substantial

minority stake, and Cross is believed to have

considered the Florido-based minimaker as s

Treasury restrictions on foreign investment,

Cross will be much less likely to be tied down

sible at tCL (CW, November 17).

by government interference than was pos-

GEC's managing director. Arnold

Welnstock, is understood to have hired

Cross within days of Cross nanouncing his

intention of leaving ICL for Collfornia.

Although GEC may be hampered by

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vestment even without the money it will get

for its share of the newly-nationalised Brit-

ish Aircraft Corp. The strength of its bank balance underlines the comparative in-

significance of the £50 million over five years

to be invested by the Ocpartment of tn-

dustry in microelectronics (CW, December

Half-yesr tigures nanounced by GEC last week show profits up 19.5% to £144.8 million

on turniver up 14% to £1,102 million com-pared with the six months to September 30,

Price 18p

Compulse Waskly for 1877 and the editorist and edvertising staffs wish all their irisads in the industry a

Ws thank you all for tha help and ca-operation wa have enjoyed during the paet year and look forward to further success in the Msw

We also send grastings to our readers who will be with us once again in 1978, when the first Issue will be published on January 5.

Briefing

Japanese

JAPANESE hardware facturers could be o target for UK software and services companies. Computing Services Association director-general Alan Benjamin visited Japan recently and was impressed by the interest shown in British services companies.

An American consultant to Fujitsu, Dr David Freeman, also recently emphasised in an exdusive Computer Weekly interview that the Jupaniese lequire software, marketing and inguistic expertise to back their drive for o share uf the computer business (CW, Octuber 13). Any moves to entist government support for such prujects could run into opposition from management and unions of British companies who are afrald of any possible effects on UK employment in hurdware manufacturing.

Elm a year deal

UNDER a contract worth innre than £t million a year, the Data Recording Instrument Co is to supply ICL with its Model 6320 matrix printer. This runs at 60 chps and will be used in ICL terminal systems in place uf the Terminet printers that the US based General Electric hus supplied to ICL.

Tax plan shelved

PLANS to include a system for Schedule D self-employed in-come taxation on the ICL 2970 mainframe at the Cumbernauld Inland Revenue accounts office have been ahelved, Financial Secretary to the Treasury Robert Sheldon told Mrs Mar-garet Bsin, MP (SNP, East Dunbartonshire) in a written Parliamentary s nswer.

Parliamentary sinswer.

Information Bill

While the Data Protection Committee near a completion of its work (CW. Oecember 1), a formal first reading was given in the House of Commons last week to aBill aimed at providing legislation relating to information held on government computers. Introduced by Labour of Information Bill is due for its section of information Bill is due for its section of information Bill is due for its section of the cheins huffs.

SOME SPECIAL SEASONAL FEATURES

This week, in the run up to Christone the medium personal distribution of the features. And there is a remarkable throughout the hundred for the specialty commissioned atory, explores the interestion of a machine ruled future. Christopher Hodder Williams, in a specialty commissioned atory, explores the interestion of associative to which and the interestion of a machine ruled future. This is provided by "14-year-old the machine and the legislation of a machine-ruled future. This is provided by "14-year-old machine and the lace of the committee and the lace of the committee and the lace of the committee and the lace of the sound the people who for computing and the people who for committee and the people who is a serie of the machine ruled future. This is provided by "14-year-old machine and the seciety in which we competition organised by the BCS, Coverty, with his essay (Page 4). Sound the seciety in which is selected to the seciety of the machine and the seciety in which we competition organised to the research of the machine seciety in which is selected to the seciety of the seciety in which is selected to the seciety of the seciety in which is selected to the seciety of the secretic of the seciety in which is selected to the seciety of the secretic of the machine seciety in which is secretic of the secreti

Ministry of Computing' call

sultable acquisition

By Robin Webster

CALLS for the establishment of a Ministry of Computing tu deal with all computer operations in the Civil Service, and for increases uf over £1,000 for progrunners and analysts within the Service, have come from the Society of Civil and Public Scrv-

The SCPS, which represents executive grade civil servants and has 8,000 computer staff out of a total membership of 105,000, says that the new authority should manage centrally the training requirements and career development schemes of Civil Service computing staff.

This was needed, uccording to Campbell Christie, deputy general secretary of the SCPS, herause of growing enneern among members about the neglect presently shown in this

The call for action came thiring n conference last week, which attempted to define the future needs of Society members

THE incorporation of Singar's

For the yeer ended September 30, 51% of ICL's total turnover of £418.7 million was in its European and International div isions. This is a 45% increase on last year, of which 24% came. from Singer business. The company'a profits for the year were very much as City analysts

The figures include a full year

"It was the largest gothering of representatives of our membership in computer areas for ormous impact, possibly leading to a closer working between the Department of Industry and the some time," said Christie. "It is clear that unless Civil Service management takes immediate Centrol Computer Agency. The CCA is responsible for advising action in respect of both these issues there is a danger of a hreakdown in Clvil Service

Although the Ministry of Conputing as currently conceived by the SCPS would be concerned only with Civil Ser-vice computing, it could form the embryo of a Ministry of Information Technology, as outlined by consultant lann Barron at the ACM/Computer Weekly conference at Hedsor

Park (CW, July 14). Barron's concept of an In-formation Technology Ministry would encompass all aspects of the impact and use of the technology, as well as the needs of the industry Itself and the staff involved in working on computer and communications

months from Cogar Corp. ICL aharaholders, which now in-

clude many of its employees, will

receive a dividend of 11.25p

predecessor, Geoff Gross,

achieved during his five years of

office, when turnover wes

compared to 8p last year.

ICL hits overseas targe of Singer business and nine

international operations has enabled ICL to achiave its target of doing more than half its bualness outsida the UK.

expected — up 31% to £30.3

INSIDE YOUR CHRISTMAS CW...

SOME SPECIAL SEASONAL FEATURES

ALSO Computerview Poetic Focus NCR rebuff for union Michie's Christmas View Black death of UK Industry GHA's Mythodology Poster

ole in the news

APPOINTMENTS-PAGES 16, 17, 23-39

Series 1 enhancements

FURTHER liberating the ICM user from attechment constraints, IBM hea snounced o programmsble communications front-end subsystem for the Series 1 mini which offectively boosts the power of the mini by alding over ell the communications functions.

Called the 4987, the front-end ellows users to accommodete both

nchronous and saynchronous protocols in a single unit, and allowe the techment of a veriety of spacialised IBM and "forsign" terminals to

Avalisho in June 1878 st s purchssa-only price of E9,871, the 4987 ncludes 89 specisi communication instructions and supports up to 32 in April, e seftwere product for prepering routines for the 4887 on Bariss 1 mini will be svallable, licensed at £327, or £5.55 a mont Available with the 4887 will be operating softwore which interfeces t

Available with the 4887 will be operating software which interfaces to the Sories 1 operating system. It costs E220 or E3.70 a month.

Sevemi Garies 1 software products have been announced, note bly o Varsion 4 of the operating system which includes the capability of making 9ories 1 look like a cluster controller to an SNA natwork around a 370 mainframe. It will be available in 18 mainths' time and will cost

E1,492 or £25.25 a month.

In Mey, Versien 2 of the operating system will be evallable, and Version 3 will follow in October. They will include a debug package, eutomatic device back-up and terminal and systems support for Series 1-Series 1 links, System 3 CCP RPG and System 370 DOS/VS &TAM

lopments at a frequency of per-

Consultants working for

SECS include Brian Moore, one

of the original 2900 architects.

and others who worked on basic

operating system development

at ICL, including the VME/ESA

haps one or Iwo per year.

use of computers.

Company may develop own VME/K A COMPANY which has users of large ICL 2900 systems recently recruited several ICL regard VME/K as a better envisaged such special deve-

experts is considering develop- alternative to VME/B for such ing its own version of the environments. VME/K operating system for An ICL spokesman said that Isrge-scale transaction proces- lorge TP applications tended to sing systems. The compeny, South Eastern requirements and that a

Computer Services, based In standard product would not sat-Kingston-Upon-Thames, has isfactorly meet these needs. considerable 2900 experience Using VME/K as o basis, ICL's and hos conducted strategy policy would be to develop studies for ICL users. SECS considers that the needs of some large scale public sector appli-cstlons can best be met by using VME/K as a bssia for a tallor made system

Computing was set up, the wider

implications could have an en-

government departments on the

Although VME/K is marketed by ICL at present primorily for the medium range 2950 and 2960 systems, it la capable of being used for large-scale TP en-

For the large scale 2970, 2976 According to ICL's nsw and 2980 systems, VME/B is the managing director Dr Chris
Wilson, his aim for the naxt five
supported by iCL, although it years would be to achieve the hos stready used VME/K as the basis for the specially tallored VME/ESA operating system, some kind of growth that his currently being run by the European Spoce Agency in Darmstadt, West Germany, or almost trabled from its 1972 level of £154 million and profits rose

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COMPLIENCEW

Chrietmes ie e family time; e time for reflection, end for quiet. But in the computerworld, there is little time for e peuse as the rapid rate of technological advence quickens further

OVER the next two years, IBM watchers expect the whole of System 370, including the 3030 series, to be replaced by DP Division, while General Systems Division extends the System 30 line to supplant System 3.

The first snnouncements are expected in Jsnuary, with the annch of the E-series to replace the bottom end of System 370, up to the level of the 135.

Internsliy the 370/115 and 125 are multiple processor complexes, aithough this is isrgely hidden from the user. The Eseries la expected to be more overtly modular, with a range of functional processor options for handling specific taska such as communications, periphers is control and databases.

The announcement is likely to include st the minimum a revsmping of the OS/VS1 operating system to accommodate the major changes in workload mixes which have taken place since 1970. It could well, in addition, come up with a new operating system, together with the ability to run VSI snd earlier systems in emulstion

Whstever the software, it will emancipate the low-end 370 batch user and move him into the bright new world of transaction procassing, offering him a rangs of distributed options. It night also incorporate some kind of advance in secondary or intermediate storage, possibly bubble memory or chargecoupled devices.
Some algnificant enhance-

ment in database capability is also likely, and there will no doubt be totally unexpected features in the new series.

This week Computer Weekly looks et some of the most significent events of the past year in which IBM, with Ita 3030 eeries price cuts in perticuler, once more sets the trend. During the year, Computerview

comments on the news and the trenda ee they develop. We end the yeer by looking eheed et some of the goodies that IBM mey be unwrepping, some time in the next

The surprises IBM has in store for 1978

replacement for the line from the 148 through to the 3033 is coming. Dubbed by some the H-series, it is expected to be announced substantially by mid-1979 and must above oil run MVS efficiently.

It is possible that the E-series operating system might be a subset of MVS, but much more likely that there will simply be a power overlsp between the Eseries and the H-series, with considerable commonslity betweeen the E and H operating

systems at the JCL level. Although it will almost certainly have considerable distubution of functions between several processors, the H-series is likely nevertheless to be a central site system, designed to support a wide range of distributed aystems presumably using SNA.

A key feature of H-series will be the System R relational database, which is likely to be presented as s compelling alternstive to IMS, though whether users will rush to convert to it ia open to question. It is not yet clear whether System R will include major elements of hardware or consist entirely of soft-

It is expected to be announced within two years, and a version is said to be running already at Boeing in the US. In whatever shape it finslly sppears, it will have to mesh with MVS, be-

Life goes on....

The DPMA hos a barrow in the market place,

They don't like the BCS examination faca,

Abandon it and everything is grand. Ob La Di, Ob La De, Life goes on.

Ob La Di, Ob Ls Ds, Life goes on.

Privscy Ia happy in the morketplace,

Ted Cluff now is the spokesman in their band;

The NCC takes a trollay to their hardwara atore,

Collecting some chips and ferrite rings; Sorts them away behind a standard sized door, Now let's see what the future brings.

Amdahl, IBM will have made an enormous investment in MVS for nothing.

A bewildering array of options will be presented to 370 users, becsuse in Februnry IBM ia due to announce DP Division's minicomputer. Orbit.

Likely to offer more power than does GSD's Series 1 mini st present, Orbit is also likely to be offered with more system soft-ware. Users should find it sn enticing alternative to msny of the conservative network products that currently make up IBM's cotalogue, with devices like the 3790 transaction syatems and the 3705 communications controller.

On all the new products, there is likely to be a strong priceperformance improvement over the products that they replace, with labour-intensive items like software and maintenance representing an increasingly large proportion of the cost.

There is some confusion in the minds of many about the relationship between IBM's DP and GS divisions, but in morketing terms they are best regarded as two independent companies. What GSD does with System 3 and the System 30 line bears very little relation to what DPD does at the bottom end of 370, and some users may well be wooed by salesmen from both divisions.

Ten years ago...

COMPUTER WEEKLY DECEMBER 14 AND 21/28, 1967

THE government's guy gritish policy aroused foers that the dovolopment of the UK computer industry would be stiffed in the long term. The UK could not metch mechines such as the CDC 6800 and proposed 7890, and the Burroughs 88500.

Philips entared the general purpose computer market with the ennouncement of the Plotte family . The management of ructure of the BCS was rechaped and a menagement committee and four divisions boards, representing braches. committee one your avaional boards, representing bracket, membership, education and lachnical interest, were formed. Polish production at computers was antering a new stega, with serial production at Odra 1103s and 1206s.

INTERRUPT. Ode to an acoustic coupler

modernise and revitalise the tnp

end of the System 3 line, and a

System 36 and perhaps a System

38 are likely next year, possibly

incorporating some new starage

All in all then, a busy, exciting

and bewildering year or so ahead for the IBM user, and

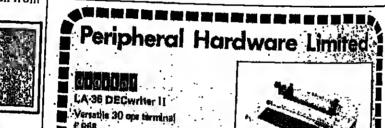
anything but a quiet life for its

Or what to do when the machine goes down

FOR Christmas, John H. Dovideon of Grephic Olspiev Systems, Cembridge, a frequent contributor to Interrupt, hec burst into votes. He wist the £5 Interrupt prize plus e £3 postic bonus. Mora posms in Committee Special on page 14.

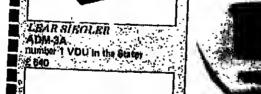
When I from the joy of 'coustic cnupled interface am tumed, By hard or software faults of gravity unknown, And when from filckering graphics screen am spurned, To wait while experts far away dn groan, Then to a task of unremitting pleasure I repair: The handset from its cosy nest displaced, I whistle to the coupler some sweet happy air. In hope to muke thus, artistry, nn display's face: At first a line, a curve, a dainty wisp of sirnw, A character ar two give abstract farm, And then perchance it wrive or minintain's drawn, And by degrees o thing of beauty's huru.
But heed, dear Friends, the one who whistles first his name along the

Shall then be deemed computer, not n mind.









EX-STOCK DELIVERY

A brand new computer with punch verifier And high level language to fox any liar. KNIGHT PROGRAMMING SUPPORT THE ORIGINAL KNIGHT CONTRACT

MODEL 3000 TAPE READER/PUNCH *Full 30cps Punching and Reading

The NCCL lends a hand:

Hard software

A digit computer fed magnetic card

Away in the city, where software was hard

With input and output and dynamic stop

Lord, help us tomorrow, we face the MD

Our systems analyst how must inatell

Sald Focus "As usual, no Christmas for me." Be near me, O Fortran and Cobol and all

The programmers' puzzlea kspt them on the hop.

Our workload exploding and holidays stopped

The fuses were blowing, the wires they were lopped

The DPC stays at home and hides nway its fncc,

While the industry carries on as plonned. Ob La Di, Ob La Dn, Life goes on.

Hoppy is the job hunter in the marketplace, When Computer Waekly lands a hand;

(with appliagles to the Besties.)

Pages after pages set a attirring pace, And 'Focus' will be there to raprimand. Ob La Di, Ob La Do, Life goes on.

*Terminal and modern V24/20mA interfeces *Compatible with all standard terminals.

*High reliability

*Automatic Reader / Punch control. 30 NEAL STREET, ICHTON WCOH 915 TEL CY1-836 4660 OF COURSE WE WISH YOU A MEBRY XMAS, BUT MOST OF ALL WE WANT TO SAY THANK YOU, MOST SINCERELY FOR YOUR CONTINUED SUPPORT WHICH HAS MADE US THE MOST POPULAR PAPER MERCHANT WE HANDLE MORE SCRAP CARDS & PRINT-OUT THAN ANY OTHER. KEEP IN TOUCH. WE HAVE A FANTASTIC DEAL LINED UP FOR YOU IN '78. BEST WISHES FROM

WANTED, TOP PHICES

THE DIRECTORS & STAFF OF DATA-WASTE LTD. 01-960 1000 SCRAP PUNCH CARDS & PRINT-OUT URGENTLY

will be fascinated to learn that O. B. Marshati (New-bridge), the firm that processes nearly 30 million of

system from Radifon Computers for its dato input.
The Seacheck system complements O. 6. Meshell's existing Burrougha' B1700 computer and io being used for Johe like jed ger updeting, psyroti, form managaniant statistics and order entry.

poultry industry that have placed orders with Redifon of lote include the Nortingham suilding Society and London-bosed magazino distributors Argus Distribution Ltd. Soth are installing Redifon Redichack

by looking back to traditions

out communications on such

msking real progress. The res-prinse from the vist majority of

US financial unalysts curr-

ently regard NCR as nue of the

most bunyant computer cnm-

our staff has been positive."

panies.

NCR snubs union on sales policy

"The determination of sales

bargaining table and dealt

with as an addendum to un an-

nnal wage claim for field engin-

ASTMS says that the need to

have some say in the policy

stems from concern over the

long-term interests of its

meinbers. Also, there was some

doubt as to whether the com-

pany was gning to relain an

element of mechanical husiness

This point was taken up by

Rex Fleet, NCR's managing director, "After a difficult period

of transition, NCR has now

consolidated its position as a

major supplier of computers and

invesiment and our future lies in

achieving further growth and

success in the dynamic en-

virumment of EDP. There is no

going back. There is no question

"Our snles policy, our R&D

policy is the responsibility of

By Robin Webster

A CALL by ASTMS for a say in standard consultation pro-NCR's sales policy, included us cedures," sald Don Frsser, part of its annual wage claim director of personnel resources (CW. December 1), has brought at NCR. "There is no way that a quick response from the com-

Normally, says NCR, it would negotiable, either with ASTMS not publicly comment on its dis- or any other outside body. cussions with unions but this particular point needed clarifi-

sening manngement," he continued. "It is totally unreal-"NCR has nn agreement with istic to suggest that it can be ASTMS restricted to field endelegated to periodic review at

Amdahl Gorp goes public

THE shares of Amdahi Corp have been approved for listing on the American Stock Exchange, one of the two New York exchanges. The eninpany aunounced that it was considering an application late last month (CW, December 8).

"We chose the American exchange rather than the Pacific in Sau Francisco because il is bigger," Dr Gene Amdalıl, founder of the Sunnyvale, California company told Camputer Weekly. "We are not yet big enough for the largest US exchange, the New York Stock

that AT&T will begin intro-

ducing the so-called Beil Dntn

Network early in 1978, although

Service is likely to be introduced

in one or two states initially, but it is intended to grow

AT&T's Bell data net

expected early in 1978

for the future.

terminals," he said.

US OBSERVERS now believe at the user site. It appears that, as with Transpac in France, the charges will be distance-independent nnd based solely on the volume nf messaga traffic sent. It will use both store-and-

forward and straight packetswitching techniques depending The network is a major plank on the urgency of the message in AT&T's challenge to IBM, and therefore the priority has been designed to provide an assigned to it by the user. The attractive alternative to IBM's delay will vary from 200 Systems Network Architecture milliseconds to four hours.

Key feature of the network concept (CW, November 10). It will allow point-to-point comwill be the additional avsilability municalinns between any com-monly used brand of terminal of software packagas for things like data entry, inculriss, RJE via a communications processor and message distribution.

MORE than 30 companies have reserved stands at Microsystems 78, and the exhibition side of the event already shows promise of being a runaway success.
The organisations which see

Microsystems as a useful mesns of bringing their products and services to a wide spectrum of engineers, aystema designera and personal computing en-thuslasts, range from giant international corporations down to the relativaly small systems. design companies which are playing an important part in the microprocesaor boom.

Among the "glants" are Texas Instruments, Intel, Digital Equipment Co. and Plessey, Microsystems, But at the other end of the scale are smallar companies such as Compelec,

Co-Mari, and Lynx Electronics which are making their name in the personal computing field. The important area of

software and systems design for inicrosystems is represented by CAP Microsoft, Warren Point and Micropower, among others. Microsystems 78 exhibition will provide something of interest to most microprocessor users from OEM purchasers to perso-

nai computing enthusiests.
Those who want to know more about the Microsystems 78 seminar should contact Chris Seminar should contact Chris Hipwell Room 125. Dorset House Stamford Street, London SEI. Telephone 01-261 8738 To book stand space at the exhibition; admits Floyd Collins at the same address. Telephone 01-261 8757, or 261 8743.



"This is a message I have been The 1977 Sowling World Cup, held lost wook of the Cherrington Sowl, Tolworth, in south west London, ottracted 79 compositors from 40 countries and the computerisod scoring system was provided by Atkino Computing.

It was the first time the ovent had been held in the tiff for 11 carrying personnlly to our staff in my visits throughout the UK during the last 12 months. We are alwnys seeking to improve kcy mutters. I believe we are

had been held in the UK for 11

Ao the pins fall scores wore in pst chilne to one of Alkins' Sigms 9 computers at nearby Epsom, using the terminal sean here behind the bowling iones. Printouts listing

rosults in esconding order were output at frequent intorvals and pieced in front of a closed-circuit camors for display on TV monitors, The scoring system become

more complex as the tournament progressed. Softwere to tackle all this was specially developed in Fortran and GPOB on the Bigms 9 London. Atkins points out that this firm should not be confused with On-Line Systems, the compony with which the Epsoni bareos is morging.

Philips into UK banking

COMPUTER WEEKLY, December 15/22, 1977

A SIGNIFICANT brenkthroug into the London hanking minrket has been made by Philips with a contract for a two-processor PTS 6000 bnnking terminal system from Cltibank's London branch.

Citihank has installed the system at its Strand offices, and intends to use one processor for order processing and stock control of the \$800 million of Irnvellers' cheques it issues an-maily. The other will be used as a six-position teller terminal system for all branch transac-

The teller system, which includes printer, keyboard and plasma display at each position. will transmit batch data daily the bank's IBM 370/135 mainframe. The travellers cheque aystem, ennsisting of Iwo VDUs and a line printer, wit ilso serve as an emergency

Cilbank has installed un enormous number and variety of minicomputers at various sites throughout the world.

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MICHIE'S **CHRISTMAS** VIEW



and i0" seconds - I.e. between

three and 30 years of con-

So readers who pollshed off

the problem in seconds or min-

utes are well ahead of the

program in their algorithms

(whstever they may be) for

inductive logic, aithough

probably not in their ability to

epresent the processes expli

Children have more diffi-

culty in inventing rulea. Even

at age 10 the transition from

judging everything by its con-

crete circumstances to an

nbility to cope with abstracts

and hypotheticals has only just

begun. Readers might like to

try their children on their

obility to understand the train

the train is going West

things a little too fine. On that

thought let me wish all readers

the merriest of Chriatmesea,

M, H. Helstaad (1975) Toward 5

theoretical basis for estimating programming efforts. Technical Raport CSD-TR 143, Purdue Uni-

J. Larson & R. S. Micholski (1977) Inductive inference of VL decision rules. ACM SIGART Newsletter,

No.63, 38-44

and a Happy New Year.

An interesting feature of the

tinunus mental effort.

Closely observed trains...

READERS were strangely continuoualy for between 10 stimulated by "Trains going enst and trains going west" (CW, November 10) and an avalanche of rules poured in for discriminating the two kinds of trains.

The following were the three simplest rules found by Larson and Michalski's inductive lear-ગોng program:

(i) If there is a trianglacontaining car immediately followed by a polygoncontaining car then Eastbound else Westbound (polygons of course include (ii) if there is a ahort closed

car then Eastbound elaa Westbound; and (iii) If there are two cars, or if there is a jagged-top ona then Wesibound else East-

first two rules is that a pro-gram knowing nothing about counting could still have got Out of a total of 72 readers' entnes, no fewer than 44 hit on them. At the other extreme one rule (iii), and six others offered reader who was bitten by the version of this same rule counting bug found that the number of sides in the cargo based on counting axles or wheels rather than trucka. (circle counts I, triangle 3, atc) ia a factor of 60 if and only if

Amazingly, only three entries corresponded to rule (II). in many ways the simplest

We sometimes forget what A fourth entry could be an elaborate trick counting is "At first thought," writes L. I scored as (li) except that the various kinds of short closed Conant, "it seems quite inconcars were separately listed incelvable that any human being stead of being given as a single ahould be destitute of the description! No entriea clicked power of counting beyond 2. with (i), but some were at least But such la the case; and in a as terse, such as: few Instances longuages have If there ore more than two been found to be absolutely destitute of pure numeral

kinds of freight, then East-bound else Westbound produced by two readers.

On the other hand the crow has been said on good evidence to count up to four. Lichten-bert's belief about hia night-How do we compare the efficiency of this Pascal program running on the CDC Cyber 175 with the ponderings Ingale acema leas well of Computer Weekly readars? founded. He gave the bird Computation time was three meelworma every day, round 10 seconds. The Cyber one at a time, and remerked

can be credited with appthet after the third it knew tha roximately 10 million instructfeaat was over. lona per second, making a total The owner of Clever Hans, outlay of 100 million the counting horae, had o aimliar faith, but the horse's art o J. M. Stroud ed in reading his mad ter's involuntary signs when the pre-aet number wea cited by Halstead, the number of binary discriminationa per

aecond which the human brain For myaelf, I find that the can manage at a aprint is ebout Australien aborigine system of "Ona, Two, Many" works pre-tty wall for most purposes, although when applied to the Although Edsger Dijkstra number of ahopping days to Chriatmaa it tends to cut

was once clocked at 50 per aecond for a three-minute burst, for mortals a more relexed avarage of 10 per sacond can probably be assumed. So how to relate the execution of one Cyber 175 instruction to the making of one binary comparison?

At this point I close my eyes and declara that one Instruction-execution is worth more than 10 and leas than 100 binary discriminations (BDa). If this be so then the Sarson-, Nichalski program required a totol of between 10" and 10" BDs, the equivalent of thinking FUTUREVIEW

quicker and could handle higher

around Man have grown more sophisticated with those two ims In mind. First the abacus then came the mechanical aids such as Babboge's calculating

Then came a great advancement in cslculating machines, a machine capable of doing calculations in a fraction of a second, the computer. From first generation valves

to third generation integrated circuits the computer was developed with the same two alms in mind, and now the computer can do calculations in microseconds. But what sbout the future?

I think four main things will change in the future due to the computer: safety, travel, public services and dangerous jobs.
Although having computers checking computers is not

economical, I think that in some cases it is essential for reasons of safety. Although some manufacturers claim that their computers are infallible they sometimes do go wrong. In the case of a Jumbo Jet for example. With pilots in the jet and personnel in ground control the passengers are quite sofe.

With pllots and onboard computer in the jet and personnel in ground control the passengers are safer still. But with pilot and onboard computer in the jet and computer with one or two men checking in ground control, a crash would be exceedingly rare.

I think planes carrying 400 or more passengers abould adopt this latter system in the future. Additionally, as far as railway

tracks are concerned, sections near platforms and bridges should be rigged so that when a person falls on to the rolls a neaaage reaches the train on the

This could be done by a computer. When a person falls on to the ralla a monitor detects the fact this hos happened and since it is connected to the computar, a message con reoch the train in microscoonds enabling the emergency brake to be pulled.

When we discover how to split up matter and ressaemble it anywhere in the universe, computers full of IF and GOTO stetements will take complete charga of the whole operation.

In fact the most luxurious and elsurely way is the safest way, leeve the work for computer controlled robots (CCRs) and computers. All wa would have to do would be to program them and save our talents to provide executed by robot, construction workers. Also to check via scanners, closed circuit television - computers aren't infelliblel

In the not too distent future we will at ill use the old 1977 rails. There would be one main control point from which a computer would separate. All the trains would have TV cameras located at various spots on the chasala which would be connected to the computer.

Further on in the future monoralla, dua to their speed and position high above the land, will probably be in use, with virtually the same system as the "old" treins.

Spaca trevel would use computers to their greatest advanputers to their greatest advantage. This is mainly dua to the
fact that space flights will take required.
so long that we will need to put
our astronauls in suspended an would be protacted by some imation. While they are in sus kind of force held so they would

MAN first used his fingers for counting when he needed to keep a record of something, for example sheep. As his herd grew his counting method became numbers with two main alms: first, efficiency; second, more time for leisure.

As time has gone by, things around Man have grown more

Ideas of a world run by robots...

allens) broke through the force

field the computer would send

one last message back to Earth

that intelligent life had evolved.

gency services in the future

mostly because both fire and

police services involve a degree

of danger. Imagine n fire in a

house. The firemen pour on

foam and man ladders. They

climb the ladders and smash the

windows with hatchets. They

climb through, pick up the vic-tlm and climh down the ladders

the victim.

CCRs will dominate the emer-

the ship?

The obvious choice is the computer or a CCR if necessary. My choice would be to hove a computer. Also what must be taken into consideration is the fact that energy must be conserved. So I suggest a kind of "Broln" Computer. When the crew is nwake the computer performs such operations as calculating ETAs.

But when the crew is in susended animation an extra part of the computer is linked in which steers the ship and avoids obstacles; however, when it cannot handle the obstacle it wakes the crew. This arrangement of the com-

puter la rather like the conscious and unconscious mind of the human bruin, with this difference: the most important function computers will be used for in space trnvel is avoiding cotnetrophes in microseconds by calculating inster than man will ever do.

A community of robots, computera end humans involved together in a reliable, workeble end economicel system. That is the Futuravlew of 14veer-old Devid Browett, of Coventry, who won the Young Computer Scientist of the Year ewerd, organised by the Coventry brench of the BCS.

Devid believes that e mechina teke-over of the world is inevitable. He sharea thie belief with two other Futureview contributors, Arthur Clerke (CW, November 10) end Isaec Asimov (CW. October 13), in this extract from his winning essey.

As computers gat more advanced they will dominate the control systema of apace ships. As in "2001: a Space Odyssey" (by Arthur C. Clarke) tha computer will run the whole ship. But there is a lesson: never build a perfect computer.

A perfect computer will be a computer of our own Image. Thia means it will be prone to experiencing aomething like human emotiona: it might get engry or bored or eventually go completely mad, As man dominatas the uni-

verse he will discover more and more planats. Some of these are bound to be abla to auatain life and these life forms might deve-lop into civilisations. Man being alone in his search, will be definitely interested in promising life forms but he cannot laave men on every planet that ha

So how can their life forma be monitored? The answer is a mini rocket

housing a computar. Such computera will monitor and relay data back to Earth end, in addition, will take off ond head for

fist, pick up the victim in n firm

grlp, and climb bock down, not

bothcring about the fumes or

anything of the sort.
As far as the police are con-

cerned, let us imagine a crook

rniding e bank ond then n

policeman coming in and apot-

ting him; tha crook would fight

hlm or run, standing a renaon-

however, would apot the crook

and grip him, then take him to

the police atation to lock him up.

render the criminal helpiese or.

in the case of organised crima, it

The CCR might fire ropes to

As almple as that.

would be armed.

ay kind of Orwellian "Big Brother" puter.

d- in whose world there is no Whet I have described is a privacy. I wouldn't carry it that entire community of CCRs. If far: I would monitor all security computers and humans establishmenta and military volved together in a reliable workable and economical workable and economical computer picked up-somathing work.

not be damaged by the "natives". If intelligent life did the CCRs in security and these evolve tha force would act as nn would srrest, or in extreme Intelligence test. When they (the cases, kill the Intruder. I do not mention medical services because I don't think anyone would like a CCR poking around In our insides - except another

'When we discover how to split up metter

and reassemble it

anywhere in the uni.

verse, computers full of IF and GOTO state.

ments will take comp.

lete charge of the

whole operation."

Who wants to blow their brains out for the sake of a plane? I think dangerous jobs such as the job of the test pilot should be undertaken by a com-puter or a CCR if needed. One reason for this is the question of reliability. When you are testing a million pound plane you want no mistakes.

holding the viction in a fireman's By programming a computer your can hope for such reliability During that epiaode the firealso radio control could be used man might he overcome by but it could go wrong moreessfumes or the fire might cause a ily then a computer, if you are plank of wood to fall on him; he testing many different klads of might even have to climb into an aircruft a CCR would be better. A humanold-type CCR would

usbestos suit hefore he rescues sit in the cockpli like a pilot -A CCR would walk up the and if the place crashes you wall, snorsh the window with its have not lost n life. They could also he used in atomic plants, of rigs — in fact, anywhere In the future Man will have a

> lot of time for leisure, and be liver that every man/woman will own a CCR or else a group will share a computer. You will wake up, program

your CC'R for the day's work and rest for the remninder of the day. You might telephone a friend using the new computer operator which offers a quick and reliable service, or plug you computer link to the library circuit and, using a VDU, rea n hook (which in netual fact the computer is sennning and tracs-

nilling into your link.)
You might plug your computer link into the information circuit and read from your usua disploy unit the weather, traffic infurmintion, cricket scores, fnotball results, almost any

thing.

Next your shopping: you will
type in your oeeds end slot the card into the transmitting unit.
The information is read by the computer and dispatched to the local supermarket. The food is loaded onto a CCR and the coil is registered in your account. he food at your house and returns back to the super-

What CCR could do in species unimaginable. It would red oxygen or food, ensbling it to stay working until it ran on o nower.

The fact ie, we don't have the There would be three types of CCRs used by the polica. Firat a tracked body-type structure with radar and firing ropes. Second, a senior humanoid CCR which would deal with inquiries and tha more sophisticated crooks. Thirdly an armad CCR in humanoid or tracked form.

Using computers in the accurity forcea would be to use a kind of Orwellian "Big Brother"

The fact ie, we don't hive life materials on our planet to keep underly science going, in industry, science going, in in

NEWS IN BRIEF \$104m French exports to US

BENEFITS to France of having CII-Honeywell Bull manufacjuring mainframes, mainly Level 64, for export to the US, are onderlined by US Department of Commerce Import-export figures. The Department estimates that in 1977 France exported \$104 million of computer equipment to the US, whereas the UK exported only \$32 million. Even Italy, with Honeywell building Level 62 there, did betier than the UK, managing \$44 million of exports.

In the reverse direction, the UK Imported an estimated \$396 million of equipment, France \$300 million and Italy only \$98

600,000. They replace IBM 3270s and are part of a plan to Iwo IBM 370/158s nt head office in Liverpool.

Pantherpicks ABS

AN Allled Business Systems Multibus computer has been in-stalled by Panther Westwinds, the prestige car maker. The f40,000 system features 48K of memory.

Gas Corp order

THE British Gas Corporation has ordered £100,000 wurth of equipment from Taylor Instrument, of Stevenage, to be installed at the liquidation and storage plant to be built on the Isle of Grain. The Taylor Quick-Scan 1300T and 1300R electronic transmitters and con-Irollers will measure and control lemperature, pressure and flow throughout the plant.

ADDS' profits up

REPORTING profits up 17% nt \$3.84 million on turnover up 37% at \$22.6 million for the first nine months of 1977, Applied Digital Data Systems of Hauppange. New York, ooted that during the July to September quarter, dell-veries to NCR represented 41% of sll business done.

Takeover

THE bid by Microdata for CMC Lid has been accepted, and the US company has acquired 75% of the operation for \$4m. Ray Parry, chairman and managing director, remains as chairman and becomes president of CMC Europe; Irvine Ella becomes managing director; and Don Fuller, president of Micro-dats, and Gary Llebei join the CMC board.

PO merger

MERGER of the Post Office Data Processing Service with the telecommunications branch, recommended in the Carter mittee report on the future of the Post Office, is to be impientedinext April.

High-speed bus

A HIGH-SPEED Inter-computer bus is the key to a multiple-processor functionally dis-Iributed aystem concept announced by Datapoint in the US. It will be launched in Europe at the Datapoint users conference In Birmingham next April. The bus can be up to 2,000 feet long and carries data at 2.5 Megabits: per second.

2900 sales

STATISTICS on world sales of. ICL's large 2900a at Saptamber 0, 1977 show that there were 23 2980a worth £62 million installed and on order. The 2976, order book stood at eight, worth £12 million, the 2970, at 42 worth £62.4 million, and the 2960 at 98, valued at £86.8 million. would have to go somewhere. Also our technological

"We make the best rudsr in more import not," he said.

In telecommunications for example, the application of computer techniques were already changing not only the capabilities of the system, but the way the system was manufactured. The industry had to face up to major structural changes, and these inevitably meant unemployment. This pattern would be repeated in

there are four main areas in which the micro should be exploited, to improve product quality and lower cost, to changa techniques, to Improve and

I wo die in plane crasn

crash of the hijecked airliner in Harold Godfrey, London region maneger of Dataskil, and Donald Matthews, a partner in the management consultancy Paat Marwick Mitchell. Both were visiting the Far East for their companies.

tainly bettar than UK models)

processed by the mini, o due General Automation SPC-16 system called by ITT the 1850 and displayed on 20 VDUs and

Improved IBM graphics

vemente over the 19M 2250 Interective s displey eyetem offered by ite eucceeeor, the

3250.
The 3250 was devoloped for ISM by Sandors Associates under an agreement made serily this year to estile Sandors' anti-trust suit against ISM (CW, February 3], and is boing manufactured by Sandars at Nashua, New Hampshira. This is under the direction of ISM's plant at Reyiolgh, North Caroline, and the ISM leboratories at Hursley in the UK.

Some of the other display improvements over the 2250 provided by the 3250 include four difforent character sizes, compared with two on the 2290, the

cheracter eizee, compered with two on the 2290, the ues of eight strakee to form each cherecter, inetesd of four, and four different line typoe — colid, deched, dotted and dot-deched.

Another importent difference is the use of two levels of control instead of one. The 3259 control unit connects directly to the interface channel of the host meinframe and can drive up to four 3255 display controllors located up to 5,000 feet away.

revenues must be used positi-vely, not to subsidiae Inefficient

and out dated industries.

Each 3255 has a 32K refresh memory and handles

ploitation, and the nation's oil everything nuw," he said. "If

The 3291 comes with a 21-inch display, an elphenumeric keyboerd, a hand hald light pon and a program function koyboerd. The latter has back lighted keys which enable the koat mainframe to

guide the operator.

Despite the more complas control provided by the 3250 and the other improvements over the 2250, it costs less than the existing system even with only one display station, IBM quotes £130,575 for a 3250 eyetam with four displays, two display controls and

IBM points out that the 3250 is generally competiblo with existing 2250 epplications programs and is supported by its Graphics Programming Sorvices packago, and its Graphics Sub-routine Packago, both f which run in a VS environmo

the scene nest year in the form of the interactive graphics deplsy system that Colcomp is devoloping around the Soler minicomputer, SEMS.

ITT 'replaces' IBM MAIN UK offices of the Roysl Insurance Group are 10 be equipped with ITT 3280 VDUbased systems worth over 660,000. They replace IBM death' of UK industry

Martin Banks reports on the Impact of Electronics Conference

The operator of this IBM 3250 graphics display system is using the light pen and program function keyboard (left) to monipulate data on the screen of the 3251 display station. He uses the alphanumeric keyboard

INDUSTRY must rapidly come to terms with the capabilities of electronics or risk the reni possibility of "going under". This was one of the themes to emerge from the Impact of Electronics Conference, organised by Electronics Weekly and held at the London Hilton last

The 150 delegates were told that the microprocessor, for example, could easily become UK industry's "black denth" if its current inflexible and complacent attitudes were not

changed. Alex d'Agapayest of CAP pulled few punches in an emotional flexible and complacent," he snid. "There is an almost Canute-like belief in static markets that technological developments connot change. We think that exports don't matter and Japanese Importa don't count. In fact many people now buy Japanese to get quality pro-

And the outomated office? d'Agapeyeff attacked the attitude held by many that says "I have an automatic right to my own secretary." The UK, he said, had an idee fixa that the automated office was pure Holivwood fiction and not a practical reality, a point made earlier in the day by David Kohler, of IBM. d'Agapayaff auggested that 1979 could be disactar year for UK industry, and gave ona or two pointers. US car manufacturars, for example, ware heavily committed to using micro-processors in their 1979 models, yet America had a falling birthrate. These cars (almost cer-

snobbery was tuking our expertise Into non-marketnble blind

the world, but still import washing machines - which is Other speakers, such as Ken

Corfield of Standard Telephones, and Dr Alfred Prommer of Signers, pinpointed some of the real effects that electronics and computer-based technologies will have on Industrial

many other industries.

According to d'Agapeveff, manufacturing apeed up administration, and to improve aeiling and mainten-

Industry must learn to exploit micros," he said, "and experts muat be used." Thia meant uaing the DP department for programming, rather than leting other engineers re-invent some very basic and ancient

to budget for retraining and development work in micro ex-

AMONG those killed in tha 1971, and had bean responsible for the development of the

Malaysia on December 4 were Godfrey Joined Dataskil in daughter.

Metthews joined Peat Mar-wick Mitchell to 1959 and became an axacutiva partner in 1968. He leaves a widow and

company's oparations in that banking and financial fields, He

leaves a widow and three child-

ITT mini controls power

in the Central Electricity

In the Central Electricity
Generating Board's North West
Region is being controlled by an and displayed on 20. VDUs and and di

new network AN ambitious multi-access network project, including one of the first ICL 2960s running

System 4 programs under DME. ls noder way at North Staffordshire Polytechnic. The 2960, which also has links

Poly pioneers

to n 2904 and a GEC 4082 mini. all installed at sites in Stafford will support 32 terminals. A further 4082 is planned for installation at Stoke, while another is likely to be at Bea-

CAP-CPP

your company makes something

you can't eat or wear, micros

may have an application for

A complete service to computer and microcomputer users

CAP-CPP, Europe's leading software house, has made remarkable progress in 1977. The highlights are:

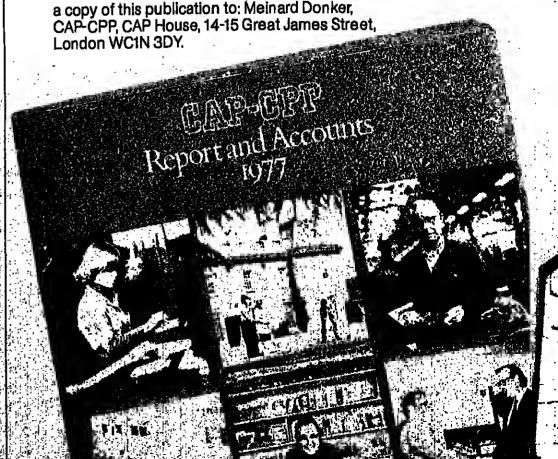
* 160 computing projects were undertaken for banking, finance and insurance, industry and commerce.

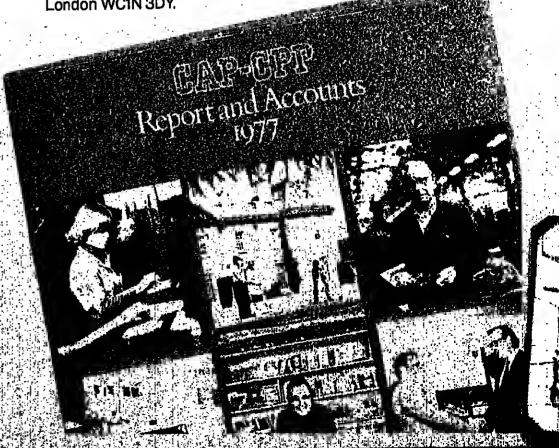
* 30 machines on CAP-CPP premises for client application developments.

* Turnover increased by 94%: professional staff by 25%.

For full details of the Group's services and progress, write for

* A world lead in microcomputer software.





GILB'S MYTHODOLOGY

Spare parts strategy for programs



online project, or its maintentem breakdowna occur due to program bugs, you know that it is important to all users of the sysiem that the programming team can diagnose the source of the error, correct it, retest the entire system, and then at the end of two to 20 hours, with luck, you can put the real time system back on the air again. With the best available technology and a lot of luck this will only happen

once a week or once a month. I know this will sound incredible, but I recently received technical papers from a oftware specialists who are responsible for the safety systems of clearly thought that the solu-tion to their reliability and maintenance problems was through structured programming. Anti-pollution forces

Needless to say, in panic (my own life was at stake) I offered to vial them at my own expense and set them stroight. I an much relieved to any they accepted, and part of what I

form the same function. Ona acts as a spare part for the clear story. other. The basic assumption is that both are well teated and that whenever a bug doea occur in one of the program versions, then exactly the same bug will not usually be present in the spare part version.

We do this with computer think about it we have actually beon practiaing this technolgrams for years.

You don't believa me, do you? Think about what a systhe application coding cost parison for retesting of a large tems programmer does when would be an acceptable inhe unexpectedly encounters a crease in the project budgat, if among you can automatically bug in the new update of the it resulted in almost immediate supplier's aoftware. He goes back to the spare part with the spare part method.

YOU are responablia for the different bugs, the old version. Fortunately for the rest of Similarly, when converting us, there is a good reason to ance. When the inevitable sys- to new programming langu- believe that we can afford the ages on the same system, we spare part software too. Exare naturally prepared to penence playa surprising tricks revert back to the old version, on our intuition. Would you even if it does run slower and is believe that writing two proleas portable, when we hit ungrsma can be cheaper than expected bugs on the recently writing one of them? That ia the experience of a large So, in fact, what I am talking number of those who have

about is making conscious use tried. And even when it has not of the concept of spare part been cheaper, there are reports programs when planning a of "only 10 per cent more."

new system. The moat The renson is that dual The renson is that dual but immediate objection la cost. distinct software can be used However, before you discard in a variety of waya to reduca the iden on cost grounds, ask tha total cost of software proyourself whether the dual duction and maintenance, so computer system you have that the effort of coding it planned (for graceful degrad twice, coding being only five to ation to one of the CPUs whan 10 per cent of a real time proatomic power plants. They the other fails), is really well ject anyway, may be a profitplanned. Half the breakdown able investment. causes are hardware, but half One example is the kind of

of them are from software, in- thing that Rauli of Thomsoncluding user written programs. CSF In Parla has practised. He la it really consistent codes electronic dealgn proeconomics to buy hardware grams in APL, as a cheap aparea and not to buy software model (one-tenth the cost of apares? The myth that pro- Fortran) and then recodes. grams don't break down, "once from the model as a plan, in they are right," and therefore Fortran, to get a program with need no spare parts, is difficult one-tenth of the operational to break down, because the cost. told them is the idea below.

The basic idea is very simple.

Write two programs to per
The basic idea is very simple.

ware field which tell their they produce the same outputs. This amounts to auto-Software is as error-prone as inating the desk checking and hardware. There is no known automating manual validation way of guaranteeing error-free of test cases. software which is practical, if you are planning on thor-

and in any case a spare part is ough testing, like all test paths. much cheaper than a perfect this results in a considerable program. Two Volksvagena saving of human time, which are probably a more reliable more than paya for the APL hardware, and with the soft- transport alternative than one model. The APL model was ware known as files, and If you Rolla-Royce, and a lot chaaper. already paid for aince it For some real time online replaced flowcharts and noninatallations, particularly the machine readable paaudoogy on a wide scale with pro- once which feel they can afford code. Also it can be used during to have a mostly idle standby maintanance phases both as computer, even a doubling of documentation and as comamount of test cases. And who verify that your flowcharls are repair of aoftware faults, using correctly updated along with

SOFTWARE FILE

More efficiency, ease of use in Mark IV update code. Firmware saves the scope for hard to the use of interpreted changes in the IMS bits to the code. Firmware saves the scope for hard to the control of user the control of user

incorporated in Release 7, which should be delivered to the 60olus UK uaers by the end of

The release increases the efficiency, ease of use, and interface capabilities of this popular system in several nreas. Many users feel that these represent the greatest step forward yet in any single release of the product.

In the area of efficiency, Release 7 extends the use of compiled code routines, which are selected at execution time. This should increase the speed of the system, which is in general limit to be restrictive. Other

College, proposes:

print (input request):

while read(d): d≠0 do

case d in (read fresh dutu),

(carry on)

out print ("clot") esoc;

mode queries and requests

clude pravision for the nutomatic sequencing of logical segments and increased control over undate transactions. Fueilities for the manipulation of source statements have also been improved, making It easier to retrieve Mark IV programs for modification.

Interfaces to IBM's IMS and Cincom's Tutal have also been enhanced, chiefly by providing fur logical records greater than 32K. About a third of IMS installations worldwide also use Mark IV and some users have recently found the previous 32K

Chasing Series business

Later in the new year, by

online inquiry facilities will

avnilable as optional eate

These features will hand

queries either through CKSo

via informatics own telepors

As part of the new release,

applicability of Mark Who

heen extended to include p

implementation under Univer

sing monitor, Intercomm

A LEADING UK Burrouph eoftwere house has set us a canociate compeny to say a cluelvely for users of the keo oughe Sories L visible seed

computer.
The company, to be less use Silnn Associates trd, all have Mike Silnn, the sense. boss of Silnn System and a director of Law Data System. es chairmen, with Paul Whyes ond Tony Sentley et joh general managers. Silon said he was their t

Serios L market because it h the lergest installed user bat the UK, Burroughs was opt for diso-based development end he could provide the ro ties through his other se penies for users wisking to us grade to e B80.

The company of spents from Commerce House, Secford from January 1, 1978.

First UK use

THE program convenies puckage Necol developed is Computer Facilities (CV, la t), has achieved its first UK: The software is to be used Plectrical confractor & Bulley, of likley, Yorks, is Contury 75 to en NCR Cristico

Bailey will convert all its pro grams, amounting to about 200,000 lines of Nest/2, to ANSI 1074 Cobol, using the Nett!

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COUPLERS

FIGURE 1

PROGRAMMER NOTES

FOLLOWING the GOTO coding example submitted by Frank

House (CW, December 1), many readers have pointed out that a

structured solution to the problem as printed is trivial, using the

For example, Geoff Allwood of London Huspital Medical

However, the complete prngrum skeleton ruises interesting questions of coding and we publish it in full as a contribution to

The main routine is traversed once, without any choice of

route, before the user is offered the choice for subsequent tries.

This could be accommedated in a structured prugram, but at the

cost of defining an extra variable to keep truck of whether the

• The inbelled statements are successive stages in a sequen-

tial process, eg If you GOTO "start point" then the statement

labelled "carry on" must be subsequently executed.

The label "fresh data" is in a block global to that containing

the other labels. GOTO can skip out of the current black into a

global block, and I think that this is a reasonable thing to do on

some occasions, and should not be banned in the interests of

Progrommer Nutes invites comment on the apparent

economy and legibility of this solution. Does it depend on the

size of the procedures? What advantages would a structural

the GOTO controversy (Fig. 1). House makes the following abservations on the program:

CASE construction of Algol 68 or Pascul.

(read starting point),

begin integer number of observations; fresh data: number of observotions := rend; begin orray t. c [i: number of observations] . . . :

atart point: comment carry on: comment

structured appronch.

design confer?

statements tu read starting point; fit function from corrent best estimate ond print results;

try again: print

ut new data. 2 to input new starting point, 3 to resume, 0 to stop');

goto try ngain

if d=1 then goto freah data; if d=2 then goto start point; if d=3 than goto carry on; if d + 0 than begin print ('clot');

MPG Aids computer systems development

THE integration of software and hardware functions in Honeywell's medium-scale Level 64 machines has led to more efficient and economical use of

The extensive use of firmware n the Level 64 means that new Gcos 64 releases often include replacement circuit boards. However, much of the firmware resides in programmable ROMs and can be modified during the system generation procedures.

Designed and manufactured by CII Honeywell Bull in France, Level 64 Incorporates several aspects of larger Honeywell systems, including features of Mul-

one notable feature of the system is the distribution of processing power. Each group of peripherals has its own service processor capable of running channel programs and controlling several devices.

The disc service processor, for example, conslats of eight microprocessors, which can all work simultaneously on central processor requests.

Execution is speeded in other areas by hardware Implementation of crucial software features. The dispatcher, for example, which schedules and controls the execution of software processes, is a hardware

For each process, a process control block is built in memory which defines to the hardware such essential parameters as the iask priority, register usinge, and

status information. Hardware "semaphores" ore used for communication between co-operating processes, such as asynchronously executing programs which must at some point exchange data. A semephore set by a "producer" process will sutomntically wake

The use of hardware seinaphores to control and synchronise communication in the Gcos 64 operating system aids efficiency as well as contributing to a clean software

ROYTRON

Deskiop combination reader/punch with seriel asynchronoue RS-232C compatible intatfece.

gned to operate with a terminal device

on the same serial deta lines or alone

slandard baud rates up to 2400 baud.

Punch accepts dele et all stenderd

continuous or 4800 baud batch,

ulitizing e 32 charactai buffer.

Two modes of operation are

eletype using ASCII defined

iala codes (DC 1, 2, 3 end 4)

o activate/daactivate the reader

r punch: Manuel Mode - Coda

ectivation/deectivation of readar

selling unit to LOCAL mode.

ransparani mode. Panel switches control

or punch and associated terminel device

Teps duplication testure is provided by

provided: Auto Mode — Simuletes Model ASR 33

Reader will generale date at all

on a dadicaled serial line.

baud ralas up to 600 beud

plug-compatible reader/punch

arise from the division of all programs into data segments and pure code segments. Because all routines are re-entrant, the processor never holds more than one copy of a particular routine. Sharing of code in this way greatly facilitates the implementation of full database and teleprocessing facilities on Level

Logical segmentation also provides an optimum basis for virtual memory. Code aegments are never rewritten to backing store and swapping Is further reduced by allocating residency status according to frequency of use. In order to minimise thrashing, compilers generate

Information is protected in the processor according to its nature rather than its physical location. The system providas Individual protection for each segment using read, execute, and update flags - the "protection attributes" of the segment. Any attempt to violate a protection attribute will be

rejacted by the hardware.

At a meeting last month in

The Hague, the International

Standards Organisation sub-

committee responsible reached

finition of the Coral standard to

the UK. It seems therefore

probable that the UK standard

will also become the internatio-

Those interested in con-

tributing to the project should

apply to the BSI for copies of the

proposals. At this stage, the

ommittee is requesting com-

ment on the changes it intends

to make.

Details of the changes proposed may be obtained from the

nnl standard.

broad agreement to leave de-

trusted user programs.

the control of user instructions.

Implementation of Multica-

type protection and accurity

eatures was a major design alm

for Level 84. Four "rings" of protection are provided ranging from level 0 for the supervisor

nucleus, to level 3 for least

Have your say on BS Coral 66, RTL/2 specs

WORK to standardise the de- ferential treatment. finitiona of Coral 66 and RTL/2 has now started at the British Standards Institute. The committee on programming languages, DPS/13, Is Inviting comments from all interested users.

The standard for Coral ia likely to be based on the existing HMSO publication, Official Definition of Corni 66, with modificutions being restricted to editorial changes. However, consideration of RTL/2 is rep-

orted to be still at an early stage. The BSI regards both languages as well established and sees no point in raising again the question of which is the better language. By studying both simultaneously, DPS/13 hopes to avoid giving the impression

secretary of DPS/13, A.M. Conybeare, BSI, 101 Pentonville

that either one is receiving pre-First NCC grant repaid THE first full repayment of a back the development of the

loan under the Software Pro-ducts Scheme administered by the National Computing Centre has been completed by the Oxford firm Telecomputing.
The NCC funds were used to

MODEL 1560-AS

High speed, compact, with self-contained electronics

TPS transaction processing monitor, which now has more than 70 users worldwide. The success of the product waa recently demonstrated by ICL's decision to adopt it for marketing in the UK, following earller agreements on sales in the rest of the world (CW, October

relecomputing is to continue to market the package itself, having made 10 UK salea in the

The company recently opened a branch offica in Amsterdam at Herengracht 89A, Amaterdam 1001, Holland.

Consultancy switch pays with sales up 33% Ingram hoped to concentrate

A CHANGE in direction to conaultancy work was the major factor bahind the 33% increase in turnover recorded by the Coventry-based software house, Systams Resourcaa.

Managing director Paul In-gram said that historically his firm had been mainly concerned with project work. But an in-cressing demand for consults creasing demand for consultotiona, had halped taka, the turnover from £160,000 to just undar £240,000:

CISI moves into W. Germany

EXTENDING its international. Saarbrucken.

bureau connections into West. This is CISI's first acquisition
Germany, CISI, the computer in the German market. LKS'
sarvices arm of the French Honeywell mainframes will be atomic energy authority, has us addulted a controlling interest in the LKS Daten Service burgau of vio used to provide a scientific and scholosily oriented bureau sar-

New year springboard for Software Sciences

A RATIONALISATION of its varied but often inter-related sales and technical organisation services. has been carried out by Software The kinds of areas into which Sciencea Ltd over the last few Software Sciences will be months as a springboard for an moving more aggressively next attack on new markets and year was highlighted last week by its development of an RTL/2 overseas sales in the new year.

Sciences Inca, Products and Turnkey subsidiaries have been brought together under Pat Whale, but with some redundancies. It will be supported by the technical group with axperts dedicated to particular products and services. According to Software Sciences marketing director Tom Ulrich, the new structure

The sales force of Software

Earlier this year, Software Sciences took over Comet Comwill help to provide a "more cn-ordinated appranch oversens and will assist in providing them with better feedback in the development and selling of its

puter Services, which manufacturea micro-based aystems. And Software Sciences' TI 990-based SEED system for developing microprocessor snftwnre togethor with the RTL/2 compiler given the firm the capability to develop microbased packages and aervices in areas such as process control.

complier - the first for a micro

- for the Texas Instruments

990/10 micro due to be com-pleted in early 1978.

Review of program testing techniques

PHILOSOPHY and techniques of program testing were reviewed this week at a threeday Infatech seminar in Landon. The seminar was presented by Dr Edward Miller of Software Research Associates, California.

Dr Miller pointeil out that

Bubsequantly, he joined Stephen Howe (Consultante) where he has worked for the software reliability has been of set four-end-e-helf years on rea tms and online systems. prime concern in aerospace and military contexts. The relative lack of progress in program

Hewitt has had rosponsibility at all project stages from studies to systame implemen This work has involved bim

Peter Hewitt

CW's new

software

editor

AFTER four years as aditor of Computer Weekly's Software File, Stephen Gell has teft to work in New Zealand. From the week Peter Hewitt, 29, while the charge of Software Fite after asven years' seportence in systems analysis and programming.

On leaving university, he

worked as a programmer for Cambridge Date Processing and

wrote in Cobol and Assamble for IBM mainframes. He sie

asined esperience of IMS, 80MP and GPSS.

with a wide range of software and hardware, especially Pien. Corel, Mumps and Basic on ICL, Digital Equipment end Hewlett-Packard machines.

Bureau's Leap

EXTENSIONS to Computer

Consortium Services' Leap en-

ineering analysis package have

been implemented by SIA. They

are three new post-processors

covering dynamic analysia,

routines for plotting deflection

forces and a streas evaluation

In addition, processing capacity has been increased in

the bridge dealgn aubsyatem,

Vehicle, and the marine en-

gineering analysis program,

on the growing markat for

minicomputera — particularly first time users — during next year and pointed to his firm'a

experience with Digital

Other plans for the 30-strong firm included the completion of

an intarnal ra-organisation

almad at ateering more

resources to the consultancy side and emphasis on IBM main-

frame and small system users.

Equipment minis.

extensions

proving, despite substantial funding in recent years, had lent greater emphasis to the development of program testing. While no degree of testing can establish that all errors have

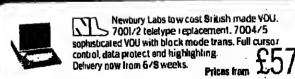
been found, several measures of program testing coverage are in existence and, in some cases, their effectiveness in improving program quality has been documented quantitatively.

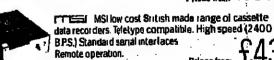
One problem in thus evaluating testing methodnlogies is the reticence of software developers to revent how many errors have been found.

As a preventative technique. one possibility is to structure the software system so that testing will be easier. For individual program segments, tools such as IFTRAN are available which will convert in either direction between programs containing special structuring constructions and standard compliable

As an alternative to comprehensive and lengthy dynamic testing, the use of static analysers and code auditors can be a highly cost-effective method of eliminating a very large number

Computer Marketing Working with and supported by British manufacturers





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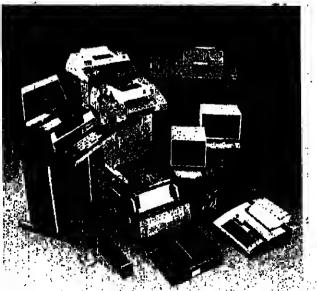
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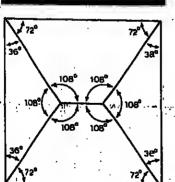


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THE above diagram represents tha plan view of a roof for a cubic building. The angles show tha actual ahape of the roof facas, the cantre ridga baing higher than the eaves. After watching the roof put up, the architect had a stranga dream.

Similar roofs were baing arected on each face of the building sidewaya roofs on the walla and an inverted roof beneath the floor. The completed building assumed a sur-priaingly regular shape. What shape was it?

Turn to page 39 for the solution



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COMPUTER WEEKLY, December 15/22, 1977



Walsgrave appeal success

LESS than six months after being launched, the Walsgrave Hospital Scanner Appaal hos reached its £220,000 target, and monay la ailli coming in. The Coventry hospital now has enough money, with a £100,000 contribution from the War-wickahire Regional Hosith Authorliy, to buy the CAT acanner it needs, which will serve Coventry

Infotech courses

February 1978

Advanced Systems and Programming

Computer Systems and Installation Security 7-9 Feb London

Advanced PL/1 Programming Techniques 14-16 Feb London

Communications Techniques 27 Fab - 1 Mar London How to Organise and Control Structured Programming Teams

Tools and Techniques for the Software Development Manager

Fundamentals of Teleprocessing Systems 6-10 Feb London System Design for Teleprocessing 13-15 Feb London Data Communications Networks 13-15 Feb London

How to Get the Best out of IMS 20-24 Fob London .

Minicomputers and Microcomputers

Date Communications National 13-15 Feb London
Advanced Real Time Software Workshop 27 Feb - 3 Mar London
Distributed Processing Systems 21-23 Fab London

How to Improve Systems Development Productivity 20-22 Feb London

Jackson Design Methodology: Training Workshop 20 Feb - 3 Mar London

Management Development

Project Management — Level I 6-10 Feb London

Project Management — Level II 13-17 Fab London

Project Management — Level III 1-3 Fab London

27 Feb - 3 Mar London

Real Time/Data Communications

15-17 Fab London

Data Base

13-15 Feb London

and the county of Warwickshire.

The CAT seanner, which uses a computer to process X-ray data and produce a cross-sactional image greatly superior to that obtained by conventional X-ray methods (CW. Money has poured in from every possible source, jumble asies held by possible source, jumble asies need by kids in parenta' garages, pensionars' savings, gifts from small and large companiea, apecially organiaed dances, funny football matches, October 20), is now considered a necessity in a wall-equipped hos-plial. But health authorities budgets sponsored walks and sliences and swims, shop-floor collections and the sale of T-shirts. do not often run to £320,000 for one machine, however apphisticated.

> For example, the Royal Marsden Hospital in Surrey has recently acquired an EMI acanner which will be used both for cancer reacarch and for diagnosis. Although the scanner was paid for by the Cancer Research Campaign, the amount made a size-able bile into the Campaign's budget for the year (and in fact an appeal has been isunched in the computer industry to take some of the strain by raising the cost of the scanner's

enmputer, see bolow).
The Walsgrave Appeal was launched by Bill Whatmore, a surgeon at the hospital, and Mike Cotton, a chartared surveyor of

It was given extensive coverage by Iha Coventry Evening Telegraph, and then it really took off. Children in the aummer holidays, workers in factorias, hoapital pallents, church congregations, all visd with each other in organising events. The money started to roll in fast, and by autumn the take was averaging

£7,000 a week. Coventry City FC gave the players' fines, Massey-Ferguson gove £20,000, Chrysler gave o car, a retired miner gave £250 "from a tin box," and the Leamington Lions gova £1,000 from their annual spon-sored pub-crawl. Three organists gave a concert. Arnold Lodge School, Leamington govo £500 from

THE role of online computer systems in purchasing and supply will be examined during a ona-day confarence organised by the Computer Specialist Section of the Institute of Purchasing and Supply. The system of the Europa Hotel, London WI, on January 25. Further information from Mrs C. Mouleng, IPS, York House, Westminster Bridge Road, London SEI 7UT. Tel: 01-929 1851.

THE use of PABX exchanges and the application of new technology to private switching systems will be discussed of a confarence entitled Private Electronic Switching Systems schedulad for April 10-12, 1978. The confarence is organised by the institution of Electrical Engineers and will be hald at the IEE Headquarters. Sayoy Pace. London WOZ The meeting has been timed to follow the Communications. 78. Exposition in Birmingham on April 47, Further details of other evenus from the IEE Conference.

Data Base Design and Administration Workshop 6-10 Feb London Performance Evaluation and Optimisation of On-Line Dato Base Systems More evants ore scheduled for the

Now Year.
"No wny will the extro mnney be wasted," saya Mike Cotton, "We Data Base Integrity and Recovery Techniques 27 Feb - 1 Mar London ahall now be going for the optional extras, so that the people of Coven-Minicomputer Systems: Assessment and Application 14-16 Fab London Minicomputer Systems: Evaluation and Selection 21-23 Fab London try and Watwickshire can hove the best machina in Europe." Minicomputers for Commercial Real Time 28 Feb - 2 Mar London
Microprocessors: Assessment and Application 28 Feb - 2 Mar London And no-ona ean say they don't

 Details of Walsgrava Scannar IBM DOS and DOS/VS Basic Operations Techniques 7-9 Fab London Appeal events can be obtained by phoning the Scanner Office on the Those interested in contributing to

Data Control Techniques 21-23 Feb London
Tape Library Control Techniques 28 Feb - 1 Mar London
IBM DOS and DOS/VS Advanced Operations Techniques the Royal Maraden Appeal should IBM OS and OS/VS Advanced Operations Techniques 7-9 Fab London conlact David Ayars al Tritech the Cancer Research Campaign at 2 ICL 1900 Advanced Operations Techniques Operations Team Control and Carlton House Terrace, London Supervision - Level 1 6-10 Fob London

Operations Team Control and Supervision - Level II 21-23 Fab London ons Management and Control Techniques 20-22 Feb London On-Line Operations Management and Control Techniques 23-24 Feb Landon

Pic

ass send me further deteils of	:	
Advenced Systems	☐ Structured Design	

and Progremming ☐ Menagement Develo ☐ Real/Time/

Data Commu

Return now to:

De ta Base ☐ Minicomputers and

☐ Operatione

Address

INFOTECH



PEOPLE

Univac man moves to US

UNIVAC director Ted Jones has moved in the US headquarters as director of public relations. He will be based at the Univac Worldwide Commounications Department in

Blue Bell, Pennsylvanin.

Jones, n chartered accountant by profession, joined the company in 1964 and has held several management positions with Univac, inchiding that of director of marketing, UK.

Rene Berger, formerly illrector of Honaywell's South-West and Scotland region, hos been appointed director of the DP division, and Jim Ouncan, ex-Northern region

general systems division.

The former Southern region director, David Crofts, becomes director of Southern region and central government within the DP division. Frad Snow, who was director of the former field sales division, is transferring to Honeywell's US Information Systems Group as director of marketing.

with the P-E Consulting Group, has joined the board of Park Buainess Systema, a subsidiary of P-E International, and will be responsible for the marketing and aupport of the

Fred Ainsley joins Scicon as sales consultant specialising in automation systems. He was formerly manager of Westinghouse's sales group for computer-based telometry

The real time systems division of Scicon is joined by Rob Clubh, former senior design and development enginear with Allied Busi-ness Systems, as a technical consultant, and Borrie Brinkman, previously project leader in the Post Office's telecomma development de-partment, as a consultant.

Roger Parsons, until lotely sales manager for the London region willi Prime Computer UK, hos been

ed May

somert manager.

DECEMBER 19
Miniconference on minicomputers for information retrieval. IICS information Ratrieval Group/Adib Information Retrieval. University of Manchester Institute for Science and Technology. Manchester, 11.00.

Manerasiar, 11.00
DECEMBER 20
Human reliability in man-machine systems, colloquium, institute of Electrical Engineers, IEE, Suvoy Pince, London WC2, 10.30. Register with IEE.

A systems approach to pictorial initern recognition — lecture series. Martion Nadier. Machine intelligence Research tinh. Chess Lab., MIRTI, University of Edinburgh, 10 30

Computerised tomographical scanning, locture. Institution of Electrical Engineers. IEE, Sovoy Pisca, London WC2. 5.00 for 5.30. Impact of minicomputers in developing countries. Dr. Y. Packer. BUS Developing Countries Groep. Zeus Harmes, Capper Street, London WC1. 18,00.

Menagamani mattors. Rt Han Sir Ho-rold Wilson. BCS, Marseyside branch. Adolphi Hotel, Liverpool, 18.00. JANUARY 9

integrated circuits - reliability, colin

megrated circuita - reliability, colin-quium, institution of Electricol Enginoers. IEE, Ssvoy Piace, Loodon WC2, 13.30. Register with IEE. Computar stell recruitment and ramunorotion. R. Camplisid. BCS, Bedford branch. Crast Mofel, Luton. 18.30.

Soffolk Polica command and control system. Chief Supt W. Hogger. BCS, East Anglie branch. Anchor Hotel, Theflord. 18,00. JANUARY 10

Holographyentara the microfilm world.
Pater Waterworth. BCS Microform
Group. NCR Ltd, 206 Marylebono Road,
London NW1. 18.30.
Viewdato, the personal computer of the
future. Sam Fedida. BCS, Croydon
branch. Fairfiald Halls, Croydon. 18.15.
Weather forceasting with the Cray
machine. Dr Rob Brinkhuysen, BCS.
Reading branch. Venue to be announced.

Reading branch, Venue to be announced.

Praction! Honeywell computing Speakara from Honeywell Information: Systems. Data Processing Management Association. Bull Hotel, Gerraria Cross.

JANUARY 11

Richard Gill and Clive Owerchave joined Systems Resources, the Coventry-based software house, as

consultants. Gill, who is an IBM TP

ylonite where he was a semor pro-

Gordan Young, computer officer

Liverpnol University has been

romoted to section manager, oftware, in the computer lah.

Roderick Cook has been appointed a

demonstrator in computational and

Randolph Madoo has joined I. P. Sharp as an API, consultant. He recently challed his IIA degree in computing science and statistics

rom University College, London.

Frank Chabre becomes personnel

ector with Rockwell Internatio-

nal's electronic systems group in Dallus, Texas, Previously he held the

same position with the company's

Collins commercial telecomors

Poter Breeze, furnishly a senior systems engineer with Unicon, lass licen promated to UK technical

Ray Galanic of Cara Data Proces

sing, until recently sales manager, has been appointed regional ma

John Sindflebottom, assistant sys

teins design manager for Greater

Manchester Transport, has been

specialist, came from Bakelin

grammer, while tiwer was pre-

foosly a consultant at Altergo

JANDARY II
International telex switching systems
C. C. Harman, E. E. Daniels, institution of
Electrical Engineera, H.E., Savny Place,
Landon WC2, 17,00 for 17,10.

What this DPM thinks of the independent computer specialist. Genry Flaher,
Association of Independent Computer
Specialists, AICS, 8 Left ester Street,
Landon WC2, 18,30.

Visit to Young's Research of Computer
Installation, ICS, Kingston upon Thomes
branch, Regional Management Centre, 40
Countier Road, New Mathien, 17,00.
Numbers limited,
Discatting systems, Geoff Newell BCS,
North London Immeh, West Codge Pack
linel, Cockfinsters, Midds, 19,45.

Data Input without a Regional, John
tiore, Roy Thomas, BCS, South Essex
Franch, The Huff's Eye, Bashiban, 19,45.

Microprocessors P. Crowe, BCS,
Bristol branch, St Vincent Rocks Hotel,
Bristol, 10,15.

Stock control, Or M. J. Wulsh, BCS,
Belfast branch, Wimisur Hotel, Belfost,
19,30.

Helfast branch, Windsur Hatel, Belfost, 19.30. Experience with a commercial G. Anderanic, IICS, Edinburg

branch, Mountbutten Bldg, Harlot Watt University, Edinburgh, 17.30. JANUARY 12-13 Programming group desting. IBM Computer Users' Association. Washington Hotel, London.

JANUARY 17 Ellects on society of tachnological change, Borrie Sharman, Association for Computing Mochinery, Polytecknic of Central Lundon, Lundon Wt. 18.15.

JANUARY IS JANUARY IS
Doto compunications, a personal view.
John McNully. Data Procassing Manogamont Association. CDI, 77 Wells
Street, London WI. 18.00.
The polential of digital processors in
radin communication systems, colloquium. Institution of Electrical Engineers.
IEE, Savoy Plaes, London WC2. 10.30.
Regisler with IEE.
Computere and this blind. Prof J. L.
Douco. BCS. North Stalls branch. NorthStaffa Madical Instituto, Newcastleunder-Lyms. 20.00.

JANUARY 18-19

JANUARY 19



Introduction to Science

SCIENCE can be as excling as romantic as fantasy—this is cantral idea of a series of plan for children aged 7-11 from its Molsculs Club, an offshort London's Marmald Thasis.

The latest of the plays Parl Apart, is the story of two cits ran's asceps from e volcas arupflon, during which is

arupilon, during which the arupilon aoms basic fact ster magnatiem and electricity Polas Apart will be en touched South of England and Will thia spring.
For further details place
Suzanno Skupinski at the Ma
maid, 01-238 9521.

Schools quiz

on computing SIXTEEN Merseyside scheels have entered for an inter-school quiz on computing organised by the BCS Merseyside branch in conjunction with the Meng St.
Computer Education Group.
The four rounds will take that
in January, February, Marchael

Recruitment firm branches out

THE controlling company of 52 Specialist Computer Recruires a branching out into the securi

Peter Rigby and Association acquired three secretaril agents Angela Chapman Personni is Ivernool, Clive Court Employer: Agency in Birmingham saids. Girls Employment Office in 12 fo of Landon, and plans to form \$575. national chain.

The group aims to start a general sufficiency executive recruitment or parry, based in London's West End during the first quarter of 1918.



TIVE ASKED CHRIS MERLIN FOR A FUTUREVIEW OF THE



I'M NOT SURE IF SHOULD PREDICE





OR SMALL OUTPA BUPPERS STRIK BY LIGHTNING



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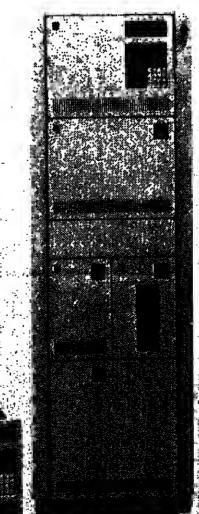
Year Poplar in

support, including PL/I and Fortran, and a real-time operating system—all backed by IBM's service.

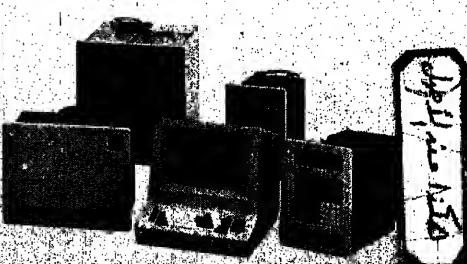
Its flexible communications capabilities enable the IBM Series/1 to accept an important role in DPas both a network controller and remote work station. And you'll be surprised how

And IBM offers software quickly it can be installed and working.

> If you'd like further details of IBM's Series/1 systems (prices start from around £7,500), call Rick Ackland Snow at: IBM United Kingdom Limited, General Systems Division, London Wall Branch, 40 Basinghall Street, London EC2. Tel: 01-628 7700, ext. 2661.



IBM United Kingdom Limited



MICRO NEWS

Edited by Martin Banks

Single chip system trendsetter of year

can be seld to have any significance, the most interesting developments of the past year have occurred in the single chip "system" area. To be sure, some of the hardware will not be available until next year, but recent announcements from Intel, Zilog and Motorola have sll pointed to the route that the micro manufacturers are plan-

To a Isrge extant, the significance of the announcement of the Intel 8021, the Zilog Z-8 and Motorola 6801 lies not in the products themselves, but in what they represent as a technological trend. All are being almed at applications where a relatively small amount of memory coupled with some I/O capability can be employed with the minimum of extraneous dealgn activity on the part of the user. One chip and just a few sddltlonal componenta can be engineered into a working system with a minimum of exper-

The applications themselves. certainly in computing terms, do not yet represent a dynamic advance, coming as they do in the form of process control opers-tions and slightly less than mor-onic terminals. But as a level of

ducts, and with a price reduction of traditional semiconductor proportions, they represent s significant step down the road towarda the real single chip computer system. The Introduction of these pro-

ducts must also be considered in relation to the other major developmenta from these three companies, the Intel 8086, Zilog Z-8000 and the Motorola MACS. All are 16-bit processors with a computing power that will be equivalent to systems from the Digital Equipment PDP-11 range. They represent the semiconductor companiea' continued push for greater integration and computing power. They will be expensive and require considerable initial expertise in their implementation. They will, however, follow and extend the pattern now being set by the 8021, Z-8 and 6801.

significant event of the past year has occurred in the related area of semiconductor memory devices. The manufacturers, dominated as they are by the requirement of maintaining high volume production, have estab-

sight unaeen, even though the pricatag is about £200. Who sald the Britiah were a cautious race? Perhaps the other most

llahed a long tradition of price attrition as a means of expan-ding the available market for a dealing with personnel or economist when considering **NS** data capture system his DP budget for the coming year; and must be able to com-CLAIMED to be the first single inunicate with programmers and engineers regarding tech-nical matters. Add to all this Input latchea and provision for chip data acquisition system, the handling external signal con-National Semiconductor ADCO816 can be used to replace the fact that he muat be sware Housed in a 40-pin package, the device can perform a conup to £100 worth of analogue to of the problems of uacrs and it

digital conversion equipment in version in 50 microseconds, and a variety of applications.
Included on the chip are an ia particularly suited to medical instruments, process control, ing-bit analogue to digital condustriol control and machine verter with Tri-State latched outputs, a 18-channel expandable multiplexer with address control. In quantities of 100, the device is priced at £12.95.

Courses on Rockwell 6500

64 THINK GOOD PAY

FOLLOWING the decision of Rockwell to manufacture the 6500 family of microprocessors designed by MOS Technology, Its UK distributor, Pelco Electronics has instituted a series of three-day courses covering tho basic theory and hardware of the davice.

The main aim of the course will be to initiate participanta Into the practical use of the main 6500 fomily design aids, the KIM-I and System 05.

One course will be run each month during 1978, with a maximum of six engineers per

The fee will ba £85 per person. Further information can be obtained from Pelco at Enter-

Road, Hova, Sussex BN 3 1JB. **Memories stocked**

priaa House, 83/85 Western

OFF the ahelf delivery of intel add-on mamory ayatema for Digital Equipment LSI-II computers can now be obtained from Rapid Recall.

Typical of the systems to be atocked is the in-1611, which is said to offer better performance than its DEC counterpart for lesa money and in lesa space.

52% SAY THAT

Cosmac VIP

merket la RCA Solid State with its Cosmac VIP computer kit. Sessed on the continuation of the computer of the computer

keyboard, 100 byte per second cassstte interface and powe

aupply.

The ROM is utilised to hold the operating system, which provides such facilities as direct interfacing with a TV, simplified loading of RAM, data transfer from RAM to cassette and single steeping.

aingle stepping of programs.

Easy aspandability has been made a prime feature of the kit, and an sapansion board is available that can accommodate up to 32K bytes of additional RAM, plus a further 19 input/output lines.



Visitors to the Pleasey stand, at Systems '77 Munich, discussing the Ben Miproc 16-AS high speed microcomputer system with Alan Senior (for right), Microsystems sales manager in Germany.

Impressive debut THE Plessey Miproc 16-AS stainless s

microcomputer system, which made ita public debut in Germany nt Systems 77, has found a rendy market with Krautkranier GnibH, a Cologne-based manufacturer of ultrosonic nondestructive testing equipment.

Six systems have been sold to the company, where they will be used as high speed controllers in automatic test equipment used In the production of high graile

stainless steel tubing. The tubing hos to be tested for internni onil external diameters, plus wall thickness, and the testing has to take place while the tube is rotating at 2000 rpm and being fed through the tester at one nietre per second. Plessey has also sold nine sys-

Iems to Quaye DV, a specialist systems house located in Kaarst near Dusseldorf. These will be used in process control.

By Bernard Allen

OP SPOT

hla Inatallation.

operators belong.

which they are calculated.

Here he is rastricted by the

aworda pay riaes, by govern-ment legislation, and possibly by the trada union to which his

Ideally, increments should

61% WOULD LIKE

empted the manufacturer's rate

of price cuts, and orders flooded

in based on the premise that the

price would be right come deli-

part has, however, far exceeded the rate at which the part can be

produced. It will now be some

time before orders are fulfilled and the price becomes "right". Finally, on a different tack

from the industry proper, Lynx

Electronica made tha potentially

algnificant discovery that a UK

hobby computer market may

exist after all. At its Wembley

seminar, it sold 96 Nascom

computer kits, bringing the totol sold to ovar 300 (CW, December

8). Virtually all were bought

The volume of orders for the

very day.

TO carry out his function The manager—man effectively, an operations manager needs to be familiar with many subjects. He playa the role of a psychologist when dealing with personnel or recruiting new staff; that of an economist when considering months and the operations

maneger ahould consult the shift-leaders when putting his views to the DPM.

In this context, each operator should be told how well, or badly, he is doing.

becomes clear that his task la If the respect of hia staff is varied and complicated. vital to an operations mannger Firstly the DP budget conthen he should try to gain it. In cerns capital expenditure such this matter it is important that as the purchase of new he does not become a mouthperipherals, core atorage, piece of his DPM's viewa -VDUs and ancillary equip-ment. In this regard the aociolise with his staff too operations manager should have an up-to-date knowledge

After defining installation of the equipment available, the procedures and regulations, he relative costa and its worth to muat ensure that his directives are followed fully by the Secondly, it involves staff operators and must support his asiarles and the msnner in ataff, should disputes with related departments occur. manner in which the compony

At many installations it is n rule that only operators, engineers and systems programmera, when requiring "linndson" time, sre allowed to enter the computer room. It is important that the operations manager does not alter this

be related directly to the true value of each operator in the rule under any circumatances. Installation. They should be Thia is particularly annoying linked to staff appraisals and disheartening for the contaking place every three or six sole Operator who has taken the time and trouble to plun the order of his workload. Such plunning usually involves the setting-up of jub queurs and the mounting of discs.

While his foremust runsideration must be the service accurded to users, he must not allow them to dictate either to himself or to his staff. For example, if a member of payroll staff has to woit for his output lunger than usual dur to a printer being unt of service, the operations manager shund infurm the person of the cause of the delay and not allow the work schedule to be disrupted, except in extreme circumstances.

Although remaining de tuched to a certain extract in socialising with staff, ite must lio able tu cumminiente with them on all unitters regarding work. This billingo between detachment unil cuminunlention is difficult to achieve and maintoin, but is important.

A good appurtunity to relate to personnel occurs nt staff meetings, but these are often restricted to senior operators, shift-leodera ond the opern-

tions manager.

Au excellent idea is to allow a different member of each shift to attend the meeting on each occasion, whether they be a senior operator, operator or traince. This enables all staff to get a much broader view of the running of the installation, and a greater awareness of the problems to be overcome. Such a scheme lends to more interest on behalf of the staff, because apally can arise when operators lock encourage-

The manager must be able to acrept constructive chicism from his staff and, in the appropriate situation, actopo it. Operators regularly have good ideas about the manner in which the computer rooms organised and run, but are rurely given encouragement.

When triking to operators, and discussing their abilities and shortcomings with shiftleathers, it is essential that the mininger gets an accurate assessment which will help him to ensure that each shift lms a balanced staff.

Clasely akin to this is the recrultment of ataff, and the operations manager must be able to ussess o candidate and cansider if he will fit into the Installution.

The uperutions manager has n great deal of responsibility to his company, his staff, and nhuve all to himself.

PECHINEY KUHLMANN





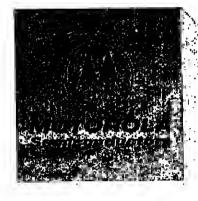
They all talk the same language.

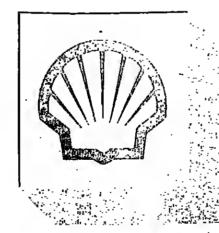


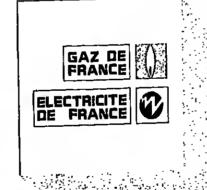
















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Photograph by Geoffrey Sturb

DOWNTIME CHRISTMAS SPECIAL

AT exactly 23.57 hours East ctilious, exact. He wonted things to be orderly. He did his own

irritating degree of disorder was the guerrilla warfare being waged by President Patani, self. was hard to take this micro-Hitler serio osly.

In Rempnna there had just been one of President Patani's magnificent air ralds. His entire air force, which consisted of II Crusaders, had scattered incendiarles in all the wrong placea. Most of them fell in the river, thus creating a thrilling firework display much admired by the populace. Of the two buildings hit, one was the US Embasay. The Americans had provided Patani with the Crusaders. "The world is med," sald the operator coming off shift. Martin said, "The CIA don't

do their homework in time. It took them two years to realise that Patani was treated for paranoia in one of Michigen'a morc luxurious psychlatric homes before they finelly went aour on him. I think I can smell the American Ambassador's dinner T-bone ateak, very overdona Everything in order, up here?"

"Yes, Mr Hillman, Blggest program running is the cenaua. it's all on file now and we're just running the finol check on the S wit usually gave away more to Zs. But It'a virtually in the about Wilbur than his prey.

"Anything on the printer

"Only a few rude remarks

from the validation aoftware

aaking ua if we've forgotten

what 'alphabatical order'

meana"
"I agree with the software; we

should have got it togather by

"Anyway, we've got it ell in the machine."

all out." Ha signed over from the

retiring supervisor. "And picase

take your coke cans with you," he added — then sighed resign-

edly sa Wilbur, the American,

atrolled in from the date prepa-

ration room. Wilbur, who

thought himself funny, wes a six

foot bore with quizzical eyes,

sketched in halr end a disast-

roualy ill-conceived approach to

women. "Evening, Martin. San-

derson wents to have a little

"Noted. Wilbur, all Input

floppies for the census must be

chet with you in his office.'

Martin said, "Then let's get it

Affican Time, Martin Hillman pulled on to the car park at Rempana City Centre. It was a busy place even at this time of night. Cors were parked in all the wrong bays. This always annoved Martin He was pun. to be orderly. He did his own thing in an orderly way — he was the best shift aupervisor at the Computer Centre — so why couldn't other people? The stock excuae for this irritating degree of disorder was

lous grin went with this.

"Incinerate them right now." "That's done "

here so late?" Sanderaon was data processing manager. Normally he observed only office

condition is interesting. If he were human, I'd say he was in a distinctly neurotic atate. But automoted devices like Sanderaon do not auffer from neuroais, so it must be something elae. He Is merely overheated. So just take a cooling fan and you'll find ell hia LSIa go back to normal." "Maybe he'a been the victim of too many of your jokes,

"He'a not coming over funny." "That'a what I meant."

"SHUT the door, Martin." Sanderson looked grim. Also frightened. There was certainly nothing mechanical about him but than Wilbur's attempta at Wilbur hadn't got a girl - an

unfashionable atate of affairs in Rempana which, according to the travel brochures, was "Exotic, erotic Rampana, where beautiful girls were more plenti-

ful on the beach than the pebbles". Wilbur only found the as a black market in nukes?"

pebbles, and onkind colleagues proclaimed that if he auddenly did find e girl among tham he'd turn her instantly to atone. "Martin, aomeone'a been abuaing our communications go on ahlft. "How? They can't opan up tha

system without a badge number." Sanderson got up arthritically and hobbled ovar to s wall dia-

channels

grem. "The inataliation at Martin aald flatly, "That means Patani'a man hava got into the Intelligence Post. But

"A badge number is not a

got a gun in his back." shredded, together with any vanguard been using the remote one. Up Wlibur aeld, "They already

terminal? Sanderson limpad back to his auch a good jdb with the are. I've sent them off to the cheir. "Long enough to get what government, life was delactabla.

"I atili don't see —"

"They've gone clean through here by using RJE to Nairobl. There is a classifled package there called TAKNUKE." Sanderson rapped out the solution to the mnemonic. "Trajectory, ozimoth, kinetics for nucleor kayed enumeration . . . if you get the ldea."

Martin aald, "Patani's delusions of grandeur must have gone critical. How did he get the password for the package?" Sandarson said flatly, "Does It

natter? He got it." Martin sald, "Considering Patani has to go on hia hands

and knees for basic ammunition, why are you taking this seriously? The mon's a nut. Don't think me impertinent, Sanderson, but why get the shits about the latest thing in Amins?" He stared at the emptied whisky bottle on the desk, wondering if the heat had gone to Sanderson'a brain, "Tocticol Nuclear Weapons can't exactly

be bought in any locol duko." Sanderson stared back with eyaa blurred from alcohol. "Ara you saying there's no auch thing

Which was the inatant when Martin wondered, once again, about the structure of Ngara'a gorage. The conversation about it had token place only a few minutes before he'd left home to

MARTIN said, "I've juat aeen that garage Ngara hoa been building It's odd."

Erika said, "You're going to be lata on shift." Her mind wasn't on Ngara's garage. She was wondering how close the border fighting was going to gat. Up till now, sha'd regarded it as nothing much more than an occupational hazard; if you chose to great deal of use if the operator a live in the uneasy political "How long has Patani's weigh it off against the physical climate of East Africa you had to Rempana, where Martin had

You bought everything there bulbs for the garden, bulbs for the lights; excellent beef from locally reared stock; kerosene and butter, which often savoured of each other; toys for Cludy, who broke them; mosquito nets and envelopes; jeans for Erika who looked good in them even when-as now -ahe was two months pregnant; KD ahorts for Martin, whom they

A hall of mortar bombs went off between Jennah and the you?" valley, sending showers of sparks overhead until they seemed to mingle with the stars. Mortin soid, "I'm never late on

"In that case you've got time to change out of those awful ahorts. They're baggy on you. Put on some weight, darling, or chuck them out."

"Who the hell puts on weight n this lieat?" "Who the hell wears shorts?

Ngara doesn't." "Ngara is black," Mortin snid. So what?" She examined, with disapproval, the fit of Martin'a KD shorts. "If you hnd a

bottom like Ngarn's." "Mine Isn't going to look like Ngara's just by stuffing mysclf with potntoes. He was barn with it. So don't gat kinky - and where on earth ore the car kcys?" Ha checked the stuff in his briefcaso. Thay weren't

"I'm no more and no loss Interestad in Ngera - or his pottom — than you ore in his

girl, Martin." "It wasn't Katine I made prognant, it was you. Whare ore my

She picked them up off the dresser end jingled them at him. "You keep your mind off Kotine and on those computers. Anyway, what's wrong with

"I personally wouldn't have used nine feet of concrete He crunched the gravel out to

wooden bungalow very almilar to Martin and Erika Hillman's but place, atood a few hundred meitres to the aouth, toward the main road and the lake. A few lights shone there. Soon thay'd be out; Ketina, bleck and provocstive, was attractive in the opposite sanse from Erika, Erika was rounded and yleiding at the touch; Ngara's girl was streamlined and taut. It was true, Martin had onca made e pass at her, down by the lake. She'd pushed anyway — It's peek holiday aea-himinto the water, fully clothed. son. What —" He'd climbed out grinning, his Sanderson ropped, "Fix some KDs looking more forlorn then cancellations, I've got to kDs looking more forlorn then ever. He said, "Shoving me in the water won't stop you looking a million dollars."

We've got to get out. You, your wife, my family. Now. Tonight!"
"I think you're a bit Katine said thoughtfuily,

"She may need all her nursing experience for your benefit, if when you're drenched. Go and explain to Eriku how you got drenched. You shall now buy

"There is also one hell of a lot of unexplained activity and we are well within tactical missile range, as you know. More than that I cannot say. In Rempans uneasy about many things. Was you can be shot for leaking less



alone in the bungalow if Pntani's snipers were so close? He'd put the question to Ngara two days ago. Ngara's nuswer hud been ambivalent. "Civil Defence seem to have faith in me, so why don't

rage. "Civil Defence and nine feet of concrete? You know President Patani has nothing that could penetrate that." It was a standing juke that Patani lad managed to get all the hig guns he wanted out of the Russlans but had omitted to think of the

slenzy sanction-busters. are sufe. The danger to us is not like Jennah — and he won't hangnlows. He wants to park his

get to Rempinia."

at him. "He won't get to Kutine, elthur." "Sarry I filpped."

NOW, Snudarsnn secmed to slump. "Martin, you've got to belleve me: wc'rc in dendly

danger."
"Then so ia cvcryono in Rcm-

"Yes, but -" use privileged information of the expense of everyonc else? Per-Ngare's house, another sonally, I think Patani Is somewhere over the rainbow,

> rifled eyes colled up at him. "Martin, doasn't your family have some influence with Pen-African Airlines?" "My father waa a director. Ho

isn't now. Why?" on a plane out - fast!"

Wasn't Eriks a treinad nurse. "Mr. Senderson, this is a bit Yet Sanderso before she married you?" well-d for me. Bottle of whisky window and fit on the desk and what the help the sell by the "You think I'm Ili, don't you?"

already. Usc my phone. Make the call. Just a small block of passengers off an outbound plane — that's all I'm asking."

leave you got a Polarold camera

Ever known me go off half-

"I've never known you pissed

cucagh to do so. But since you won't give me any facts.

"I con't even tell you what I

"Listen, Sunderson, if Patania

got semething nasty up his

sleeve that I don't know about do we just beat it secretly and leave everyone alse to fry?"

"For Christ's sake get on to

your father! He must have in-

fluence, surely? Enough to get

"But you listen to me. The

"He might have. But --

us oic an aircraft?"

ready saturated.

Cocked?

Martin spoke contemp-mously. "If that's the way you feel, you'd better use the phone right new and get a directive from the British Embassy concerning the safety of British nationals.'

"They'll say there's insufficient proof for emergency ac-

"Then they're probably right." Sanderson leapt up. "Are you (toing to use that phone, or not?" "Only to get you a box of trangallisers."

Sunderson said through dry

lips, "I don't think they'll be all

that effective against what

Patani has managed to get hold

of now."

't'llE heat in the DP manager's office seemed to have doubled within five minutes. For the first time Martin felt it just possible that Sanderson's fears had at lenst some foundation in fact. Muylic il was just possible that Patani lind Idoas about using some kind of TNW. What Marthe cooldn't stomach was the lutul emascaintion of a senior DP nan.

Studerson lenned back, Sweet was pouring down him, by now. "Okny, Martin. I gave you your clience. You're refusing to take it. I'm chartering the first sireraft I con get hold of and pushing off to Nalrobi."

Mnrtin stored at the man, dumhfounded. "You know as well us I do there's only one plane you can get hold of - and er, You have a wife and four children and you can't fly. That means you and a pilot and one other." "That's the score."

As if to punctuate Sanderson's comment, a heavy explosion. not very far distant, shook the windows violently.
Sanderson's lips had gose:

blue. Ha tried to say something but the words would't come out. Mertin had naver sean such neat terror in a man. An HE shell hen struck a building and gone off. Once every few days this had been happening, but it was considored routine. Patani was known to be almost ludicrously short of emmunition and his short of emmunitions and gunners wouldn't have passed recruit course on targe tice. Probably the HE shell he had he had the pid quarter ruins and unoccupied

weird for me. Bottle of whisky winduw and flung ir open on the desk, and what the help the sill lay the Polaroid careful.

in 1968 Christopher Hodder-Williams' book Fiatful of Digits was published. It was the culmination of a number of yasra of campaigning by a group which renged from computer acientlats to psychietriats. The sim of the campaign was to try to elert acciety to the Impect of information Computer Weskly, Hodder-Williams continues his explor-

ation of the wey man, machine end eociety might interect in

Sanderson grabbed it and took a random shot at the brightly lit street outside. Sobbing now, he counted the seconds, then stripped the backing off the plate.

A very uninspired colour photograph of no almost deserted street was the net rerate we'll run out of mag tape."

Martin glanced down at it for a few seconds, then left the room.

HE took over the shift hat his mind wasn't on computers. He had seen a man he'd respected suddenly go to pieces as if some unseen metaphysical force had performed psychological vivisection. Having checked that the batchwork was running up to date and the online systems were in order. Martin went thoughfully to the phone and dialled a number. To the day man at the far end he said. "That last shell; where did it go off, do you know?"

He was told it was a small HE rocket that hnd hit a carper warehouse in Lower Pynt. There were no casualties but a sotall fire had broken out. Firefighting equipment was on the

"Did anyone photograph it?" Martin asked. "Who'd print It?"

Wilbur, who had strolled up from the data prep room, wanted to know what all the fuss was about.

Martin said, "Why would a man take a shot of an empty street, Wilhar, with a Polaroid camera, just after an HE shell had exploded several miles 3W3V2

"Is that the clay to today's Crossword?" But Martin was dialling again.

"It's the chie to something. Get lost, will you?" Wilbur said, "That's all people ever say to me. Get lost. What is t that makes me such a thrill?" "t don't know. Go and play

with a pebble . . . Erika, thut "What a time to phone, Are you about to confess? A neighoour has grassed on you, Martin.

be annoyed about It."

"About what?"

dive into the lake."

as never before."

I'm trying to decide whether to

About your unacheduled

"Erika, ilsten very cnrefully —

"Just listen, Phone Ngarn the

The one you were so rude

"The one I was so dumb

about. Immediately you've hung

up, get Cindy out of bed. Grab s

ew of her toys. Pack a few cans

of fruit juice and cola and milk

and a few cans of food. When

you phone Ngara tell him l

know why he built the goraga

with nine foot concrete. Tell him

"Don't ask questiona: You're

carrying our baby and you've

also got Cludy. I want you in

it's time you all got in there."
"What in God's name—"

that garage."
"Promise to phone later?"

"And what ebout you?".

Hang up now."

phone you back at Ngara's.

Martin walked briskly through the airtight doors of the

computer room Itaeif. The

moment I've finished talking.

You know that garage he's just

"You sound . . . scared."

Martin dashed down to Sonderson's (wasno need to take a picture. Ha

puter sulte. He could see from the lights that the test tape was completely blank. 'The operator said, "So what's

The man caught Martin's look.

"I'll phone you at Ngara's if I get the opportunity." oang at all." "Neutrop bomb. Leaves a rotten little musbroom cloude but "I'll tell you all about me when

Please yourself Martin dilled Digara's number

Hodder-Willems himself has a lifestyle that might be typicsi of the Eighties, as he seelly integretse literary and hnological activities.

DOWNTIME CHRISTMAS SPECIA

can be treated. Most important

thing, please: blood groups.

They must be known. Do you

Martin did not answer Im-

mediately. He could not bring

hiniself to disillusion Ngaru on a point of such irony. Not one digit of the census remained in the

computer. Not one line of it had

been printed out. It would take

six months at least to start again

from the neat forms that were

stacked in the vaults downstairs.

Hc knew that Kutine lind diff-

iculty in hearing him because

her sobs, terrible and deep and

long drawn-out, were throbbing

Martin said, "I understand

perfectly . . . Has Erika forgiven

down the line.

me for kissing you?"

understand those Instructions?"

For exemple, at home he has developed an experimental recording studio where he has pionsered a practical method paign was to try to requirement thet grows more urgent as of schleving real-to-real quality for teps cassettee. And he time goes by. In this specially commissioned story for has used the studio to record radio commercials and en sibum of his own plano-accompanied songs. Fistful of Digite was published by Coronet books but is at present out

> Kailne answered Martin said, "Can I speak to

numbers if any. They request

that you run a special program

to pigeonhole them. Then the

medical people will know who

have a chance, and these people

Kniine said, "She's trying to "Sure, Mr Hillman. I hopethey nurse Ngara. When Ngnra realised you . . . were unprotected he don't do another census for a while, though, if we go on at this refused to come in the garage. Instead he phoned Civil

When do you start printing Defence. Ngara was wearing a standard electrometer. He got the results of the census itself?" enough to kill him ten times "l'lie monient it's validated. Shouldn't be long now. There'll over. He has a message for you, Martin. It comes from Civil be enough paper to reach from here to the arse end of the Nile Defence. They want you to use the census results for zoning all victims, according to how far they live from where the bomb Names, addresses, phone

when we're through." The squawkbox buzzed. Martin snatched It up. It was Wilbur, speaking from the data prep room, Withur said, "Just snw Sunderson drive off like a scalded cat . . . well, about ten minutes ago. Tyre rubber all over the car park. It may leave a very nasty smell. What cooks?"

operator who lind come on shift

with him was checking some

printout. Murtin asked hlm,

Everything okay?

Martin snapped grimly, "Just let's do our job, Wilbur, Whatever race Snnderson has just entered, I doubt if he'll win." Just as Martin cleared down

on the squawkbox there came unother explosion. It seemed muffled quite different to the one before. And long before the echo of it had died down, every warning light on the cen-Ical processor started flashing. At the same time all tape decks stopped. There was no power failure; the lights stayed on, the faus continued to cun normally.

Martin stopped breathing. stond very still, a statue in the computer room. The operator looked up at him, then back at the flashing lights. "Computer's down, Mr Hillman, Why?"

"Because there won't be a thing left on your magnetic tapes. Same applies to the disc packs. Try the tape library and you'll find every tape erased."

"I'm sorry, you've got me puzzled. Mr Hillman, ls this some kind of a joke?"

"Do I look as if I'm joking?" "You look . . . as if you've just

Martin knew the most approprinte reply to this but he didn't give it. "I'm just going down to Mr Sanderson's office."



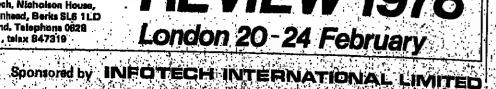


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spointed dictator of the neighbouring state. Patani ate like on updated Ferouk, drenk like Nero updated Ferouk, drenk like Nero breakfast cereal factory." A tedthey wanted." The place was nothing less than Martin aald, "I don't see what a playground. you're so shot-up about. There's But now, some were saying no online software here except "Good. Why la Sanderson that the vanguard of President for basic file Interrogation. Patani's troops had established a Patani ian't going to amuse sort of fifth colomn very close himaelf with a population to Jennah, the little township up cenaua.' the road. Jennah was a suburb of her a present. You ore n guilty "Too right . . . Anyway, I've Rempana itself — the capital — "You'd better ask hlm. Hia done the classic thing of locking and was where Erlka did the the atable door after the horae has bolted. Cut the line," shopping in Jenneh'a only doka.

government of this country has recently taken aerial shots in the Jennuh area and they koow there are microwave dishes where there shouldn't be micrownve dishes and a hell of a lot Ngara catches you kissing me of unindentified atuff that again. But you do look funny. Pittuni's guerrillas hava moved in." He tried to wipe sweat from his brow but his shirt was al.

Martin inserted the keys in the ignition but he didn't start the engine for a moment. He felt

Martin had glauced at the ga-

ammanition they needed. By the time the penny had dropped, the Rassians and cut him aut of their will. Patani had to buy mumithur, shell by shell, from

Ngura had sald, "Katine and I will make sure Eriku and Cindy Putani's threat to a township bother with a few assorted Ralls outside Government Hnuse, it's safer for Erika here

thun in Rempunu.' Murtin had said, "He'll never "That's right." Ngara beamed

"Ruther it was you thun

"He's not." Sandorson's ter-

"Hillmon, I want some sests "What the hell are you on about? You haven't e hope,

Yet Sanderson rushed forthe

"it's his camera I want." Martin paused by the doors. "What have you got printed out so far?"

"Only an error check." "How's it read?" "We're clear. Ready to roll." "Load a test tape on Deck 2, See if you get anything."

just stripped the backing off one of the unused plates. The plate was pitch black. Martin returned to the com-

this? African black magio?"
"Don't you know what wipes" magnetic tape faster than any-

frightened, "No air: What?" "Radiation" But there was hardly a beng at all.

but It turns you rotten?"
"Got any Nambutal?"
"I'd rather not sir."

February 8 9 10 1978 Sponsored and organised by IPC Business Pross We can think of lots of reasons why your should Keeping-ii louch wito a fast developing technology like me molectronics cao be fulficult. And like penping on a moving train, the ential contact can be hazadous, if not a teally painful Electronics Weekly jo smalistrave got i ajether. To organise timee days microprocessors ELECTRON **Electrical Times** wireless electrical review - World ाति एक विद्यास्त कार्यकार के का I am interested to Microsystems 78. Pieces send me detalls of the seminar programme, when tinalised My company would like to make an industry presentation at a which the appropriate box Plates feldin (hite coupan to Chila Hipwett, Room 128 Onisel House, Stemloid Straff, London S&t BLU

DI. "It is hopeless to try to make

D2. "In ten years a computer program will be World Chess

D3. "There is no reoson why a

program based on such 'type positions' could not be con-

structed. This would require.

however, a rather formidable

D4. "A real success - the production of great games and not just the avoidance of

blunders - in the attempt to

mechanise chess must at the

very least teach us a good deal

about the nature of thought"?

D5. "Chess problems are the

hymm-tunes of mathematics"?

nnalysis of the game"?

s machine play perfect

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Ton

Speed Is exhilarating when A cow in the road around the corner

is reientiess when A cow in the road around the corner

Cannot exist when A cow in the road around the corner

Why be ofraid of Death when ls just a Cow in the road around the corner?

Tim Palmer



I addressed the packet with binary coded. ioving care for someone, for a message from me

I ordered (InconSequentially) of each byte to form for you e love letter true (a heartfelt ditty written to standards set by the CCITT)

and although, like eggs on tonst, your reply was scrambled in the electronic post, it was no snag to unravel: I YOVE LOU (anag)

keeping in touch is so nice with the Post Office's Experimental Packet Switching Service

Malcolm Peltu



19th Nervous JCL STATEMENT

lt renlly doesn't matter, you know, it's Just a gnme it's Not Important. Not compared with Whether Palace won on Saturday or If Rodney will make it to numbe One next week The world won't come to no

London before the Barrier Is built, won't even Affect the supply of crumpets, stop
The spnrrows switching on In Leicester Square

Won't prevent the Thames flooding most of

Four pm precisely. And that pretty typist in Not smile tomorrow as the case may be whether I BM puts M VS on the E-series or

Big O.S. Man

He'd been n trusted

program member

operating system

ever since the eorly Illicit bootstrapping doys

but when he failed to update

on The Queue Minder'd list:

Malcolm Peltu

his store protection dues

The Supervisor ordered

his privilege bits unset and he was placed

soon to be erased

In the world

Tim Palmer

Tidying up

It's been a long shift since the year began, And there is much to shed and shred: No time now to try to feed Those valid statements still unled

Into the silent terminal, Nor yet to follow up instead Ideas, however germinal.

I've checked the logs, the discs, the tapes. Updated every manual in the place: Slave units' shackles briefly loosed And every bug that I could trace

is ironed out; Downtline approaches at a petty pace-Yet still I doubt ...

I fear that when next year's shift starts All this year's private mess will lie Swept hencath the mind's false floor. Deceiving no one but the eye Of the beholder:

No fresh new start, then? But 1-Shall be one year older.

Starts with this act:

Note for myself for New Year's Day: I've charted the flow of my life so far, Diverted the course of some endless loops, Now document just how things are, And note this fner Wherever I go, however far,

Don Mitchell

Really Basic

BASICally speaking you are the API of my core: the program look

You are the end to my rach <mark>begla</mark> and your smile makes

l must OBFY. looping round your love routine, like a spider

even the ngliest bug grin

To your each sweet CALL

Without you Pd ABEND, for Lam fust a variable for a constant called you; and I've nowhere eise

Malcolm Peltu

When Elvis died

Where were you whan Elvis Prealey dled? I was somewhere back in the Sixtles in a Chelaea spaghetti factory with you.

IT IS ELEVEN O'CLOCK the very loudspeaker blared TIME FOR THE NEWS. ELVIS PRESLEY HAS DIED.

We loughed, it was so unreal. We had no time for the news that Elv**ia** had died.

But then the wake began and it was Heartbreaking Hotela all through the night

"It's amazing," I said. "The end of an era, the start of old age." "Rubbish," you repiled "It doesn't matter at all. He never really lived,

Angry, I turned on you spagnetti tentacles flaring from my mouth, "Elvis has died, Gods shouldn't die."

Later, Groucho went too.
"Time wounds all heels," he once quipped.
Only this time it was fatal.

But you were right, of course. Thay both live in eternal dream machines.

Elvis throbbing in wax grooves, Groucho crouch-walking I'm afraid I'm still lost

somewhere back in the Sixties.

Stuck fast in trend-setting glue With no wax in which to groove,

Malcolm Peltu

The Watcher

The Watcher stands Witness to the slient mill.

Relics and ruins are Was, and ceased to be.

Time honoured aymbols Of Man remain Jutting above Watcher's humble

He has no smile de haa no mirth He has no birth The Watcher atands

Atop the hill. Witness to the silent mill. A river runa close, Winding away, He cares but little, it is always there the ildings echo with the fallings of Man, Down, along the streets they ran

With a fiery blast The sun disappears. Another day gone, or is it a year?

That too remains, o thing of That night which holds Twinkling so bright.

A star looms nbnve, Mnn was created, Created with love. Now that is gonc, Earth is olone, Man hos fled his wondrous, Faithfui, abode. The Watcher stands,

Atop the hill, Witness to the silent Relics ond ruins are His to see. All that was and ceased to be

Watcher, you with mortal eyes, Can your atone body show Earthly surprise? You were the beginning, A beginning to the cnd. Did you have to descend?

Robin Webster

CHESSLAB CHRISTMAS QUIZ

End (of year) games...

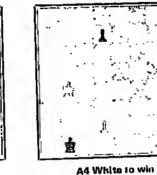
To combet the and-of-year fatigue and lassitude which may leady have set in, Chessiab this week presents 20 quest
computer ensiyees. Black is to move end draw: find his only correct move in each case. being guaranteed to a tir the aystem (human, or perhaps even machine) into action. The quiz was compiled by Danny Kopsc and Donald Michie of Edinburgh University, end Michael Clarka of Queen Mary College, London. Anawers ppear on page 39.

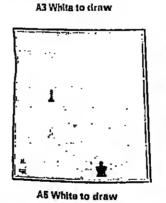
å Tha six king-pawn-king-pawn studies given below were composed with computer seelstonce. Find White's move in each



A1 White to draw

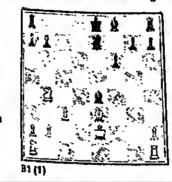




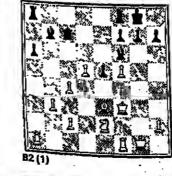


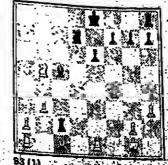


B. in asch of the three position-psire which follow, one is taken from a computer chees tournament and one from a Babby Fischer



A A





lui val

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HEALTIME COMPLITER BYSTEMS

Plug-compatible Sigmas through design stages

THE plug-compatible Sigma 9 and Sigma 11 processors under development at Telefile are through their deaign stages. The Sigma 9 the sigma 9 at the beginning of next year," he told Computer Weekly.

director. "We will begin taking lettera of intent for the Sigma 9 at the beginning of next year," he told Computer Weekly.

"We have a Sigma 6, too, and both the sigma 9 at test leads for our place will be used as test leads for our place."

should be available in the first quarter of 1979, with the Sigma 11 a little later.

Compared with the Sigma 9 built by the defunct Xerox Corp, the Telefile Sigma 9 will have a number of enhancements, notably a floating point processor according to Con. floating point processor, according to Con
Driscoll, Telefile's European managing

were hist revealed in the spring (C.w. March
31).

Telefile is taking over the lease of the

shipping firm

AN online passenger booking system for the British and Irish Steam Packel Co is to be implemented by Leasco Software Ireland. The system will be based on twin Digital Equipment PDPII/70s in Dublin, linked to 50 VDUs in the main offices of the company in the UK and Ireland.

Hardware for the system, valued at £520,000, includes £120,000 for data communications equipment, while software development for the project will cost £200,000.

Due to go live in 1979, the aervice will process reservationa for paasengera, cars, and berths. The computer will also handle part of the firm's freight operat-

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Online booking MDS wins \$10m system for Series 21 business

staking its future, the Series 21 data entry/processing terminal cluster (CW, May 13), has provided the company with about \$10 million worth of business in Europe in 1977. Naarly 600 aya-tema have been ordered or inatailed by customers. They include Truat House Forte and the Wallcome Foundation in the

Managing director of MDS in the UK, Ray Skinner, saya that many of the Series 21 ordera placed are for one or two units and could be followed up by multiple ordera. Truat House

Series 21 system at its catering division's headquarters at Cheam, Surrey, but plans to inatall several more at other

About 30 ayatems have been ahlpped in the UK to date, and Skinner points out that UK aales ahould be given a boost early in 1978 with tha introduction of an ICL 7502/7503 compatible



Europe accounted for about \$35 million of the \$72 million lurnover notched up by MDS worldwide in the first six months, ended October 31, of its current financial year. But about 60% of the turnover came from rentals on installed equipment as opposed to sales, and MDS la not prepared to reveal the value of new contracts picked up for ita older products, of which the MDS 2400 key-to-disc system is by far the most Important.

mnchines will be used as test-beds for our add-on memorles, printers and so forth. We are also planning to manufacture small disc

controllers there. The machines will probably be configured into full systems and sold at some stage and we will pick up of her used

> Some of the latest contracts for MDS 2400 systema include two from the shipping Industry. The Mersey Docks and Harbour Company has installed a 2400 to capture payroll and other data for proceasing on its IBM 370/135 mainframes, while Atlantic Container Line, the Southampton-based international consortium, has ordered a 2400 system and five MDS 6403 communicating dnta recorders to act as backup to its online network, SPEED (CW, February

Learning from home terminal

the report quoting Earl Joseph's view on the future (CW, November 24).

l am deeply diaturbed that anyone ahould aerlously consider that laarning from a terminal at home la a satisfactory aubstituta for education at achool. The learning of a subject only one of a number of functions taught at school and very probably not the moat important ona. When did you last translate

Tha need for peraonal and Riding Mill, collective discipline, interacting Northumbariand.

with others in a social group ond phyalcal education are but o few neceasary aspecta unlikely to be learned from a terminal. On an even more basic level, whnt about working Mums?

I hold no brief for teochers, and there may well be a place for terminals to halp them, but 1 do have three school-age children.

This auggeation by Eori Joseph seema o typical example of technology looking for a problam inatead of atudying the 'whole taak" J. A. B. THOMPSON

CAL national centre

Call for a Ministry of Computing

•

 \odot

Support for a theory that eters are being born in the less dense outer regions of the Orion nebula has come from computer-aided sudies carried out in the US. The large circle in the picture denotes he approximate extent of the invisible ges cloud beyond the nebula litelity while the smaller circles indicate where some of the new stars have formed. The small equeres show some of the reference stars used to determine the motions of the stars under study.

How stars are born

COMPUTER-AIDED studies

of instellar gas clouds in the

conatellation of Orion have

produced evidence supporting

theory that stars are being

formed at muny points throughout the cloud us it cul-

An unalysis of the data

obtained opprurs in the

Astrophysical Journal, and

authors of the article are Dr

Frederick Fullun, of the De-

pariment of Physics and Asi-

ronomy, University of South

Finrida, Dr Humberto Gerola,

of the IBM Thomas J. Watson

Research Centre, and Dr Sabatino Sofia of the National

Aeronautics and Space Admi-

Conventional theory holds that stars can be born only in

the dense centre of n gus or

dust cloud, where malter is

• From front paga

The main problem at present. ncenrding to the SCPS, was that 'severul departments or ministries" had developed, and that this led to o "lack of nvernit control and supervision, the likely result heing the inefficient use of resources within the Civil Service."

It calls for "a separote outhority with executive powers laboration with established creation, execution and operation in the field of comton of major computer projects MRS INGRID TOYE
Programme Organiser (CAL)
Council for Educational

as a trade or profession.

Trade or profession—

new information, however,

suggests that in the case of

Orion, at least, stars are being

born in the less dense areas as

the cloud collapses to a com-

rescurchers was to analyse the

Southern Florida, The move-

ments were obtained from two

groups of photographic plates

set was taken between 1903

and 1926 at five differen

observatories, and the second

batch hetween 1968 and 1974.

tn un attempt to flad the

process that enables such stars o form. Dr Gerola is using an

IIIM 370/168 at the Watson Research Centre, to simulate

various chemical reactions

Huit may occur in the cloud.

The Icchnique used by the

mon centre.

within the Service, both existing and projected."

Also, because of higher paying the private sector, Christle says I hat there is a current turnover of 20% n year at basic programincr level, with losses also occurring of senior and chief

To rectify this, immediate pay Increases of more than £1,000 a yenr should be made. The major obstocle hare, however, was "the rigid manner in which the sector, while being largely

WOULD like to correct an national programme, and la dis-Impression that may have been cussing other initiatives to engiven in the article, Project courage and support Computer could lead to CAL Cantre (CW, puter Managed Learning in collaboration with established creation and aupervise the being applied in the public g and Com-While it is true that the Cedar

project at Imperial Collage la one of several information aarvicea which will be dis-aeminating information about computer easiated laarning. Imperial Collegals not really in a position to take ovar from the National Davelopment Programme in Computar Assisted Learning as a national centre.

The national centra for computer assistad learning after-care, funded by the government following the cloaura of the NDPCAL, in December, will be based at the Council for Educational Technology for the UK, 3 Devonshira Streat, London WIN 2BA. Tal. 01-638 1188.

The council is establishing a number of program exchange schemes in different parts of the country and in different subject areas, based on the work of the

Prediction model

I HAVE worked out a computar model to predict sales (within 1-2%) for the ICL/Financial Timea National Management

Technology, actions louder than words DP PERSONNEL ahould be DISC - an acrofym more concerned with acting in a professional manner than baing regarded as members of a profession, said Ted Cluff, vice-chairman of the DPMA. Ha was addressing a meeting of the DCS

The other speaker, Dick Waller, of CAP, said, "in DP, people join as operators or program: mers and in two years they are on £5,000 a year. From then on addressing o meeting of the BCS operations apecialist group lost thair income in real terms sees down because of family com-mitments and inflation unil week considering whathar operations should be ragarded

Timea National Management
Gama and would be pleased to
participate with any local team
entered. This would help toward
my PhD thesis on cybarnetics

I Trent Walt

Eding: Coard Management

"What really matters is how thay retira—a superactive apprenticeship."
by others—whathar they be
lieve it to be self-avident that was lung a trade or profession. This
large behaving in a professional is not a question I can ensy?

Lift said. You have to have professional."

Meppy Chpisimas

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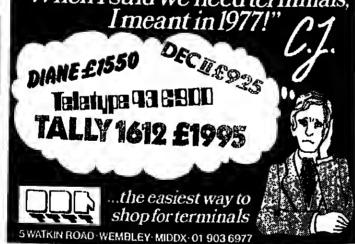
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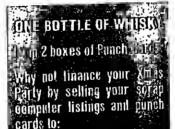
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Systems Project Leaders and Analyst Programmers

The Company

The Institution of Electrical Engineers is a non-profit making professional body whose mein lunding is from subscriptions and profits from commercial operations including INSPEC strainedional information Service for the Physics, Engineering and Computer Community)

In 1968 it became necessary to matell a computer system to provide a database for the well established abstracts journals could be

INSPEC currently uses on ICL 1902T emputes with 84K words core, 8 topo decks, 2 computer with 84K words core, 8 tepo dacks, 3 EDS 80's, computer printers, card reader and 2 printers in the foreseeable future this configuration will be up-graded to provide an on-line service utilitizing a high tevel language to INSPEC and external customers.

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The Job

Sased at Harchin in Hortforneliuro the Systems Project Leaders will rapest to the Systems Controller and will be responsible for providing systems for the production of the detection. The will involve dealing with the user deportment

He or she will also write and test program implementing the system, provide documents ion on the system for the user, the date control section, and produce internal documents iion to esset in modification of the system. Projects are handled individually or with

Additionally Analysis Programmers sea required who will be offering less qualification and exposience then the Systems Project Leaders. Programmers who wish to move into tystemoenafysis work may sleo be auttabla fo

Candidates

The Candideles must have experience of an assembly language, preferably PLAN. Expenence of text file maintenence and computer type-setting systems would be an added

Rewards

A selery in the renge £5 400-£5700 will be paid to the Systems Project Leaders, and up to £5000 for Analyst Programmers. There is a contributory sion scheme and free life assurance. The Institution operates flaxible working hours, and both posts carry holiday entitlement of 20 days.

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SYSTEMS ANALYSIS

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The Knight bumper Computer 9

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Instead, we've devised a little quiz. And we're inviting you, gentle reader, to take part.

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and send it to its.

Section 1. Ancient History

1. What and when was Leo? 2. By whom is the computer generally reck oned to have been invented, and when? 3. What was the first application of electronic

computers in this country?

Section 2. Stretch your brainpower and she could stay with her boy linead.

Lateral Thinking Problem. A student owed a huge sum of money to a college bully. The bully, lancying the student's girlfriend, proposed a bargain. He told them that he would put a black pebble and a white pebble into an empty pencil-case and then the girl would have to pick, out ne of the pebbles. The black pebble would mean that the debt was

cancelled and she would become his girlfriend. The white pebble would mean that the debt was cancelled

They were standing on a pebble-stricture path and as the bully bent down to pick up the pebbles, the gut notice dithat he picked up two black pelither and put the minute. Afraid of pointing out his distingestly, what should

When you've found the answers, out out the whole as

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Section 3. Cunning computations

Working from the left, multiply the third whole number by the lourth decimal 0.6, 3, 9, 0.7, 0.1, 0.8, 2, 4, 0.5 Find the number which completes the series Which one of the following numbers does not belong with the others? 625, 361, 256, 197, 144

Section 4. Making shapes



b) Underline the odd-man out.

Section 5. Keeping a clear head Do exactly what each sentence tells you to do:

Follow a series of complex instructions. Work carefully

. If there are five colours in the rainbowignore the next sentence. Write the first letter of the 11th word in the next sentence in the box. If pigs are pink and girailes can hy, graw a cross inside the box. Ly awa circle inside the box. If you still have anything in the box write the sum of the

Sunday is Friday, and there are always Zo days in empty write the second letter of the Iphabet in it. If the box is not empty write

2. If Landon is a large City and 12 - 3 is less than 4; write

the third letter in the sixth word of this sentence in the box. Write the letter M in the box. If the third day after

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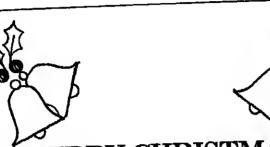
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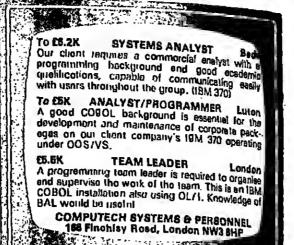
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The post of the provided candidates are normally applicate mitarly in the Technicist Research Officer setting C2884-C42821. This post offers the prospect of transfer to the objection (sitely script C2884-C4282). This post offers the prospect of transfer to the objection (sitely script C2884-C4282). This post offers the prospect of transfer to the objection (sitely script C2884-C4282). This post offers the prospect of transfer to the objection (sitely script C2884-C4282). This post offers the prospect of transfer to the objection of the

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THE SALES BIT

A story of **Christmas**

OAVIO cleared his desk with the dedication of a there. I'd better get back to Helen before the competitpostal sorter. Kompass and Bradstreet back on the ion gets In." shelf, dlary in his top drawer, the draft of his lat-Suddenly Pete was gone. est proposal into the filing leaving only a faint sugg-cabinet, gold-plated Parker estion of stale tobacco

into his inside pocket, the Oally Telegraph Into the waste-paper basket and a waster his called and a waste wafer thin calculator into working pretty hard right his black Samsonite, until now, lust minute shopping, collecting the kids, tidying only the two letters up the spare bedroom for the inevitable in-lows, per-He was aware of the chatter and rock-and-roll of haps baking or some extra the in-house feativities decoretion. Yes she'd be drifting up from tha floor busy all right, and he ought below, heavy breathing to a to go and help her — but,

mnybe just for half at

ecr pattern. Yet It was all so

unsettling, and what was

euphonia, but their siren call hour. I mean, li wnuldn't held no attraction for him. look right not putling in an Instead, he stored out no appearance at oil. a ncon-spangled London He opened the other lelfrom the vantage of his 14th ter just to get the situation straight in his mind. floor pigeon-hole ond

climax of disco and tonic

wondered how mony of the

in a single sentence. "Well

"Come on man, what are

answers

Al: Kfl; A2: Kbl; A3:

Kg3; A4; Kc3; A5: c3-c4; A6:

"Dear Mr Crosby, we nre 84 Chrisimas cards which lensed to offer you the post he had sent to clients and Yes, they had doprospects of varying finitely offered him the job. potential were witnessing He felt quite chuffed. After similar celebrations within oll they were a well restheir electric typewrller pected compony with probjungle. The context of the ably the best kil in the narketploce. It could be a rambling internal memn good move for him. Cert. from his sales manager alnly it nuginented his carcould have been expressed

done David, now do twice worse, he had inflicted the as much next year." insecurity upon himself hy He found himself forn applying for the job in the between the ego boost and cyclic fullity that were Anyway, nu more dwel-Implicit within the com-munication. So he was top ling on the topic, he decided. salesman agoin. Sure hc enthe hollday he'll talk it over joyed the thrill of the chase with his wife. She always and ultimate success — hut

had a sensible contribution to make. Yes, definitely the what was he really best plan of action. Further thought was David abandoned the abandoned as Pele came sullen gin and tonic and through the office door went through the door almost forgetting to open it, as he conveyed a half pint which still oscillated with the recent departure of the glass of gln and tonic amorous Peter. He decrowned with a forlorn scended the stairs to the plece of waterlogged lemon. David casually turned the hectic office below ond could detect the abandoned papers face down on the desk. laughter of the heavy breasted Helen above the

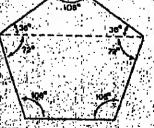
you doing here? Things are Clearly Peter's presentation really moving downstairs. had not had the sensual Here, I brought you a drink." "Sure," David heard effect he had hoped for.
Perhaps It's time I tried himself saying. "Just had to my Jean-Paul Sartre routine tldy up a few things. How's it going with the beautiful Helen?" he thought, that's always been a good bird puller. "We're on to the philosophy of existence at the moment. All I have to do is

"We're on to the philosophy of existence at the moment. All I have to do is

switch into my Omar Khayyam routine. Live today, for tomorrow we die today for today for today for today for today fo - and I'm home and dry. at least, not too late. Anyway, I'll see you down TRADER

chat and lobbying hubbub.

Puzzle answer ANSWERS to the Christmas Chessleb Quiz



BI(1) Iron-Fish v. Chuts 1.2; (2) Fischer v. Nicavaki, Zegreb 1970. B2 (1) Fischer v. Ham-man; Natariya 1988; (2) Sor, tie v. Chess 4.4. B3(1) Duchese V. Iron Fish, (2) Fischer V. Camera Slegen, 1970. (All computer "Camerae THE two types of roof face it computer are complementary parts of a regular pentagon, and their slope angles are also complementary. With the Nosch: Co. Nos





NEWS IN BRIEF

Viewdata goes to Zurich

HIGHLIGHTING the export potential of the Post Office's Vlewdata service, a conference on Viewdata is to be held next year in Zurich by Butler, Cox and Partners in collaboration with the Post Office.

The Zurich conference will be held on March 2 and s similar conference will be held in Birmingham on February 14.

The conferences will follow the format of a auecessful London conference held earlier this year, the transcript of which is now available for £80. Details of the conferences and the transcript can be obtained from Butler, Cox ond Partners, The Press Centre, 76 Shoe Lane, London EC4 3JB.

New factory

THE Scottish manufacturer of banking terminais and word processing equipment, Fortronic (Fife), has opened a second factory at Fife, adding 14,000 square feet to its production and development space.

Compeda board

TO further strengthen its marketing and support subsidiary THE low cost of labour, good the multinational sub-management and software skills committee of the Neddy com-Compeda, the National Research Development Corp. has appointed its financial director, David Thomson, aa chairman. Another NRDC officer, Thomas Fellowa, is to serve as a part-time board

French Bill

THE French privacy and protection Bill, which had its first reading two months ago (CW, October 13), has been heavily nmended in the Senate, and returns to the National Assembly for a second reading this

1977—that was the year when the micro came into its own

the microprocessor emerged as a major catalyst in making the computer community, and society as a whole, more aware of the impact that information technology ia likely to have on all aspects of society.

It was also the year of IBM price cuts and the switch of Geoffrey Cross from ICL managing director to GEC Stateside company hunter, a year of increased recognition for the computer aervices business and a major shortage of skilled computer staff.

These were some of the most commonly quoted events of the year according to an endof-year survey by Computer Weekly which asked a number

of industry experts, "What were the highlights of 1977?" David Firnberg, director of the National Computing Centre, pointed to the need for studies at national level to analyse the impact of informaton technology.

"The year saw the emergence of real concern among an ncreasing number of people that the avallability of aggressively sold, cheop and mass produced computer sto-Low costs of labour

and use of the English language

vestment in the UK by foreign-

owned computer companies.

But the svailability of a larger

skilled labour force and better

financial Inducements in the rest

of the EEC are powerful in-

ducements for investment to be

made in other European

of a study of the investment

criteria used by multinational

companies upcrating in the UK.

The study is being carried out by

These were the main findings

countries.

are factors which attract in-



rage and processing devices had wideapread implications and that these implications, both good and bad, ought to be serioualy studied at a national ievel," he sald.

The Computer Weekly/ ACM conference on "Can Computers save Britain?" (CW, July 14), held at Hedsor Park, was cited by the director of the government's Central Computer Agency, Reay Atkinson, as one of the most mportant events of the year which helped to crystallise attention on the impact of information technology.

He also feit that microcomputers were now having an impact not only on computer

puter sector working party.

the sub-committee.

The survey was conducted

among 15 multinational com-

panies, although only nine com-

pleted a questionnaire prepared by the sub-committee. The other

companies are discussing the

factors covered by the

questionnaire in meetings with

interlm report soys that it was

"disappointed" at the overall

esponse to the questionnaire, as

t had followed discussions with

the companies involved, it was satisfied with the co-nperation

eceived from the componies

hrough a series of meetings

to their clients' IBM 370

for a bloodbath. This warning

was made at a leasing seminar in the US by Sonny Monoason, president of the Boaton-based

consultancy, the American

One of the main causes of the

Computer Appraisal Service.

vhich are still being held.

Although the sub-committee's

One of the Hedsor speakers. consultant lann Barron, cnincel the phrase "transputer" to

signify the impact of the nilcri. "The single-chip micrn is nimarily concerned with what s happening outside the processor whereas the traditional mainframe and minicumputer are primarily concerned with the computational activity within the computer."

For the services industry, 1977 was the year when thut side of the business achieved recognition by both the public and private sectors, according to the director general of Computing Services Association. Alan Benjamin. This was the year It all

happened for us," he said, "Our collaborative studies with the government crystallised this year and there were big organ-Isations in both sectors giving major system development contracts to systems houses. And it's now becoming recognised that part of a computing professional's career should be spent in the services industry because of the standards and the levels of

Neddy representatives.

Raytheon Cossor.

deficit of £110 million.

'Prepare for bloodbath'

LEASING companies that have assigned inflated residual values by underwriters at Lloyd'a of London — a problem

disaster, according to Monosson, will be leasing companies had been blind to the fine print in the Lioyd's policies saying that they panies' reliance on the insurance

panies' reliance on the insurance cover provided on reaidual diligence" in their remarketing.

Packard, Honcywell, Phillps ond

In its report, the sub-

committee says that it expects the UK balance of paymenta de-

ficit for computer trade to

worsen in 1977 from lost year's

Lloyd'a of London — a problem highlighted last week (CW, Dc-

Monosson pointed out that the leasing of new large com-puters had been very easy with

Lloyd's underwriters guarante-

eing the revenues from them, but leasing companies had been blind to the fine print in the

the impartance of a viable national suftware business with "a welcome intervention by the NEB through the formution of the Insac computer services company," was enulhasised by ASTMS national organiser, Tim Webb.

But, he added, "although trade unian membership continued tu grow nationg computer atoff, it was nut good year far the industry as a whole, with government pay policy creating a majni obstacle in recruiting qualified technical ataff on to fruzen saiary scales.'

For Nevilla Taylor, chairman of the Data Processing Management Association, 1977 would be remembered for the start of the mini/micro revolution coupled with an increasing emphasis on the user Professor Paul Samet, BCS president, and director of the computing centre at University College, London, said that 1977 saw the beginning of a realisation that distributed processing systems will change the nature of computer departments and the woy they will work.

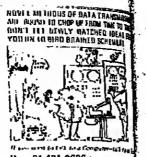
Japan to attract investment in UK

cut turiffs an imported mainframes ond peripherals has been reported in the US, but the Jananese Ministry of International Trade and Industry says no

Other companies which did not fill in the questionnaire were IBM, Burroughs, CDC, Olivetti and Siemens. Companies completing the questionnaire were Data General, Interdota, NCR, Nixdorf, Univac. Hewlett

pany had not completed the questionnaire was that it would have to reveal proprietory information, but that the company had subsequently had a "lung and fruitful" meeting with decision has been reached.

Jupan is under considerable pressure from both the US and he EEC to cut turiffs un a luond front in order to give a slimulus to the world economy and cut back its ennrmous foreign trade



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DoE sets research

architecture and building d is to he the subject of a m research programme initial the Department of the vironment.As a first 🛪 Systems Simulation Ltd been commissioned to defin

work plan for the project. The DoE research air conrdinate experience

The man-computer inte is seen as a particularly of area for these systems, and Department expects to exi experience from several i including hospitals and ge husiness systems.

consider particular tooks techniques and may nwn system, Cedar 3, while almut to enter an evalu

Alan Sutcliffe feels that eg optimism about computer huilding design was justified.

"There is a lot more to do! the enthusiasts thought. the time to take stock and where we must go," he sald

continued, "but the bigg prublem remains archite resistunce to their use.

up CAD programm

enmuter aided design building ond to improve stunding of its capabilities current limitations.

The research will recommendations on the D

Systems Simulation die

"There are many good to puter systems available,

COMPUTER AUTOMATION ALPHA 16 LSI-2 **NAKED MINI LSI-2**

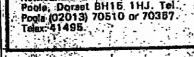
HPAC has davaloped a CORAL 65 compilar for COMPUTE AUTOMATION's LSI-2 comparable to the powerful RMC CORAL 66 compiler for the PDP-11. The same acures program have been compiled under each of the compilers and run will identical effect on the respective compilers. identical effact on the respective computers.

Full information on both compilars is available.

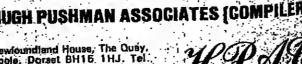
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370/145.H02 — 6981/2, 7855, 3910, 8810 — March 1978 370/138.100 — New system Irom IBM — February 1978 3333; 11/3830:11 × 8 Disc System



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